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T R E A T I S E

ON THE

H Y D R O C E L E :

CONTAINING

AN EXAMINATION OF ALL THE USUAL METHODS  
OF OBTAINING RELIEF IN THAT DISEASE.

T H E

R A D I C A L C U R E B Y I N J E C T I O N

IS PARTICULARLY DESCRIBED,

AND ILLUSTRATED WITH CASES.

---

By *JAMES EARLE, Esq.*

SURGEON EXTRAORDINARY TO HIS MAJESTY'S HOUSEHOLD,  
AND  
SENIOR SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

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1791.



T O  
WILLIAM AUSTIN, M. D.

FELLOW OF THE COLLEGE OF PHYSICIANS,  
AND  
PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

S I R,

*PERMIT me to have the honor  
of inscribing to you the following treatise, which was  
submitted in manuscript to your perusal.*

*The approbation of so distinguished a judge of general literature, and more particularly of every branch of medical knowledge, could not fail of being highly grateful and encouraging to the writer.*

*I am, SIR,  
with great esteem,  
your much obliged  
and most obedient servant,*

JAMES EARLE.

Hanover Square,  
July 20, 1791.

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A  
T R E A T I S E  
O N T H E  
H Y D R O C E L E.

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I N my edition of the works of the late Mr. Pott was inserted an account of a method of curing the Hydrocele, which appeared to me preferable to any which I had known practised in this country; but it having been suggested that the success of the operation was scarcely sufficiently established by the cases which were there exhibited, and the subject being of importance to a considerable part of mankind, I have been induced to resume it, and to relate what further observations on it have occurred.

My former tract, being joined to Mr. Pott's comprehensive account of every species of Hydrocele, rendered superfluous any other introduction; but this, not having the same advantage, requires some previous description of the disease itself; though it may not be necessary to enter very deeply into what has been repeatedly discussed by more able writers, and is now pretty generally understood.

The researches after a safe, easy, and effectual cure for the Hydrocele have exercised the ingenuity of many practitioners, and a variety of methods have been adopted; these, I presume, it will not be unuseful to collect and bring into one point of view, to give some account of the rise and progress of each, and to examine their respective merits and defects.

THE term Hydrocele is usually applied by surgeons to that species of swelling in the scrotum which is formed by an accumulation  
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of a watry fluid; it is a disease to which all descriptions and conditions of men are subject, from the earliest infancy to the latest age, and to which the healthy, the infirm, the weak, the robust, the voluptuous, and the abstemious, appear to be equally liable. The original cause, in some instances, may be traced, but generally is not to be discovered. A blow, or a contusion, has been often known to produce it; sometimes it is subsequent to a hernia humoralis: the most common cause perhaps is relaxation, as appears from the frequency of it in warm climates.

There are varieties, in the situation and appearances of this disease, which have been noticed by several writers. I mean to confine my observations to that kind which is most common, and is formed between the coats which envelop the testicle; these are well known to be two only, the tunica albuginea, which is the immediate and proper

covering of its vascular structure, and the tunica vaginalis, which is a continuation of the same membrane, but being reflected forwards, loosely invests the testis and the greater part of its epididymis, without any connection except in the hinder part\*. On the surface of these, as on every membrane which lines the various cavities in animal bodies, there is a constant secretion of a fluid which prevents any cohesion, and permits the easy motion of contiguous parts: this fluid is usually kept from increasing beyond what is necessary for the above purposes, by vessels destined to absorb the redundancy. If either of these offices be not duly performed, that is, if the secretion and absorption do not keep pace with each other, an alteration in the state of the parts must be the consequence.

\* For a more particular description of the structure of these parts, vid. Pott on the Hydrocele.



I shall not dwell at present on the effects of a defective secretion from these surfaces, but if either the fluid be secreted too fast, or, what perhaps is most commonly the case, the powers of the absorbent vessels fail, a tumor is formed which gradually becomes more and more perceptible as the collection increases, and constitutes the Hydrocele.

The size and appearance of the tumor vary in different persons and under different circumstances. At its beginning is usually rather round, but as it increases, if it meets with no resistance, generally assumes a pyriform figure, with its larger extremity downward; the nature of membranes being to stretch and accommodate themselves to gradual distention, it sometimes increases to an enormous bulk, reaching in some cases almost to the knees. If the tumor in its growth meets with resistance, as from a tight suspensory bandage, it sometimes takes a lateral

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direction

direction so as to reach toward the groin on one side and into the opposite side of the scrotum on the other.

It is perfectly indolent in itself, though its weight does sometimes produce a small degree of uneasiness in the back. The transparency of the tumor, which is mentioned by some writers as a characteristic of the disease, is not always discernible, being frequently prevented in adults by the thickness of the tunic and scrotum, and sometimes by the opacity of the contained fluid. In infants, the thinness of these parts and the clearness of the water almost always suffer the rays of light to pass through. In some cases it is so distended as to be hard and almost incompressible; in others, though the Hydrocele may have been of long standing, it is so soft and lax that the testicle is easily perceptible; if the tunica vaginalis be thin, the testicle may be perceived; but if the tunic be firm, or thickened, the testis often  
cannot

cannot be felt distinctly, though, to an intelligent observer, there is almost always a sensation where the testicle is connected, sufficient to direct where a puncture ought not to be made: this is a point of the utmost consequence to be ascertained, as a wound of the body of the testis would not only miss of evacuating the water, but would be productive of the most dangerous consequence. The usual place where the testis is fixed is in the posterior and middle part of the tumor; if the swelling be not very large, it is rather towards the bottom; but as this sometimes varies, the situation of it must be determined by the tactus eruditus of the examiner, and will be discovered by the firmness and hardness arising from the body of the testis, together with its appendage the epididymis, being of a denser or more solid texture than any of the contiguous parts. In every other part of the tumor, the two membranes being

unconnected, and affording a void space for the collection of water, the difference will always be distinguishable.

In most cases of Hydrocele the spermatic vessels may be distinctly felt above the tumor, which is the first mark of the disease to be attended to; it however sometimes happens that the accumulating water meeting with resistance below, rises into the superior part of the tunica vaginalis, and distends it quite up into the ring of the abdominal muscles, so as to make extremely difficult, if not impossible, to feel the spermatic process. This circumstance throws an obscurity on the nature of the case, and confounds it with the appearance of a descent of intestine, or omentum; other symptoms and marks are then to be adverted to: in the Hydrocele the tumor can never be made to disappear by any position of the body, or any pressure of the hand; but in the hernia scrotalis, unless it be adherent,

herent, or incarcerated, the tumor may be returned into the cavity of the abdomen by gentle pressure on it, assisted by a favourable or horizontal position of the body. Or in case it cannot be returned, the patient being directed to cough, a protrusion from the abdomen may generally be discovered by the impulse which it receives from the action of the abdominal muscles; from which the Hydrocele, being unconnected with the contents of the abdomen, is wholly exempt.

Another circumstance which I have remarked is, that on pressing the tumor upward, the superior termination of it, if it be a Hydrocele, will be sometimes evident to the view, though it may be too far engaged within the ring to be discoverable by the touch.

The history of the case often helps to point out the difference between the two diseases, the Hydrocele begins below, the hernia above. Too great attention cannot be given to every



mark of discrimination, as a mistake of one for the other might prove fatal.

It is sometimes difficult to distinguish the Hydrocele from a diseased and enlarged testis, particularly when the texture of the gland is become loose, or when there is some fluid in the body of it, which often happens; the feel of the tumor is then precisely that of a hydrocele. Other circumstances however there are which generally lead to determine its true nature; the greater proportionate weight of the tumor, the varicous state of the vessels, the inequality of the surface, and the painful sensation which usually attends the examination, or handling a diseased testicle, are distinguishing marks of it.

A collection of water frequently accompanies a scirrhus enlargement of the testicle, and in such cases is probably caused by it; but a simple Hydrocele will not produce a disease in the testicle. Some degree of enlargement of  
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the parts indeed we generally find accompanying Hydroceles, particularly those of large size and long duration; but this is not disease, it is probably only the effect of the continued pressure of the accumulating water. It is the nature of membranes to thicken in proportion to the resistance which they are obliged to make. We find this evidently in the tunica vaginalis, which usually grows in thickness as it becomes more distended, and we may reasonably conclude, that the tunica albuginea is thickened by the counter pressure from the same cause, which will give an apparent enlargement to the body of the testis: when the pressure is removed by discharging the water, and its return prevented by the radical cure, provided too great inflammation has not been excited by the operation, the testis appears to grow smaller at the termination of the cure than when the water was evacuated. This effect must be produced

ed by both the tunics becoming thinner and more contracted, and is a sort of proof of the fact being as I have stated, that the most frequent increase in the size of the testis in Hydroceles arises from the thickening of the tunics, and that it is caused by pressure: the same effect is produced in the peritonæum in cases of the ascites, and still more evidently in hernial sacs, in which great distention causes it to grow thick and hard; fluids, collected in the ovaria, in the cavities of joints, in the thecæ of tendons, and I believe may be added, in every part of the body, have generally the same effect to a certain degree, beyond which indeed the efforts of nature, to get rid of the contents, cause the parietes to become partially thin.

A slight enlargement therefore of the parts is not a prohibition to the radical cure of a Hydrocele, though a cancerous or scirrhus state of the testis certainly is, as it would  
be



be highly imprudent and unsafe to irritate and inflame an already distempered gland.

Considering then the disease as a simple, well defined Hydrocele, which, though not a painful complaint, is obstructive to the exertions of the indigent and laborious, a considerable impediment to the active pleasures of the opulent, and is found to be so unseemly, inconvenient and troublesome by all, as to demand the assistance of surgery ; we will next proceed to examine the various means which have been practised for its relief.

#### THE PALLIATIVE CURE.

THE evacuation of the water is sufficient to remove the present inconvenience arising from distention, and should in general be performed at least once on those who determine to undergo a radical cure, as it gives an opportunity of examining the state of the testis, and also of permitting the  
cavity

cavity to be filled again, only to such a size as may be thought to be best calculated to insure success in any future operation.

The palliative cure consists in drawing off the water by a puncture made through the scrotum and tunica vaginalis; for this purpose some have preferred the lancet, others the trochar. I make no scruple in recommending the latter, as it completely evacuates the water with ease and expedition. When the wound is made by a lancet, nothing is left to maintain a communication between the opening in the scrotum and that of the tunica vaginalis, consequently the water is often either prevented from coming out of the sac at all, or it escapes into the cellular membrane, and cannot find the passage through the scrotum; to obviate this, the practitioner, as I have often remarked, is obliged to introduce a probe, which cannot always be readily effected, and makes the operation painful and

tedious.

tedious. The only reason for doing it with a lancet, which, in my opinion, can obtain, is when there is any doubt of the nature of the case, or the situation of the testis; under such circumstances a small incision may certainly be conducted more superficially, and with less hazard, by means of a lancet than by a trochar: but when no such circumstances exist, the trochar is preferable. The best method to do the operation is to grasp the upper part of the tumor with the left hand, as tight as can be without giving pain, then to plunge a small trochar into the anterior part of it, rather lower than the middle, the finger being previously applied to the cannula to regulate the precise depth it is to penetrate, and any blood vessel which may be visible being carefully avoided. The stilet is then to be withdrawn, and the cannula left till the water is evacuated.

I have never found a patient, who has undergone

dergone both these operations, choofe again to fubmit to the lancet; they are, however, both eafily practicable by any one who is acquainted with the ftructure and fituation of the parts concerned; and the evacuation of the water, as was obferved, affords a temporary relief; but the neceffity of the frequent repetition of it, from the almoft conftant return of the complaint, the inconvenient magnitude which the tumor muft attain before it can fafely be attempted, with the danger, and fometimes pain, attending the diftention, render the producing a permanent cure a moft defirable object.

The methods which have been employed for the radical cure of the Hydrocele are many: in giving an account of them I fhall follow the order in which they are laid down by the learned Monf. Sabatier. Indeed this gentleman has confidered the fubject with fuch accuracy, that little can be faid with regard

to the history or description of them, which is not to be found in his excellent memoir. His observations, therefore, I shall freely make use of, and in doing this shall render some of my readers the greater service, as his work, I believe, has not yet appeared in our language, and is not so universally known among us as it deserves.

The operations may be reduced to six principal ones; the incision, the excision, the caustic, the tent, the seton, and injections.

#### THE INCISION.

AN incision through the whole extent of the Hydrocele, so as to bring the naked testis completely into view, is the most ancient operation we have any account of; it was practised even before it was known that the complaint was susceptible of a palliative cure. Galen was the first who mentioned that it

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might



might be relieved by evacuating the water through a cannula, introduced by means of a puncture; but Celsus, who preceded him by about a century, described the operation of incision. The operation, he observes, should be done on the scrotum at the time it is most full, and the fluid most abundant, and when the patient is adult. When the water is in small quantity, or the subject is young, the operation should be performed in the groin, after having raised the tumor towards that side; it is not sufficient to evacuate the water, but part also of the coats which contain it should be removed; the wound should be cleansed and washed with water in which salt and nitre are dissolved. This is all which Celsus says on the subject. It is not very clear whether or not he means that the incision should be made the whole length of the tumor, and how the dressings were applied we are left to conjecture,

ture, unless he deemed it unnecessary to repeat the directions which he had given in another place, particularly in cap. 19, lib. 7, where he has described at length the method of treating wounds after any operation of incision into the scrotum.

Paulus Egineta is much more exact in this respect; he omits no precaution which may be necessary to ensure the success of the operation. The patient, he says, should be placed on his back, his loins sustained by pillows, and the scrotum by a sponge placed underneath. The incision is to commence at the middle of the tumor, and to be carried to the upper part of it, in a line parallel to the raphè. This incision is only to go through the teguments; the bag which contains the water is then to be opened, and part of the sides of the sac to be taken away; after which a director is to be introduced, and conveyed to the bottom of the scrotum, and a division

is to be made to the bottom, that the discharge of blood and matter may find a free exit: the cavity is to be filled with lint, and the neighbouring parts and the belly are to be fomented; when the wound is cleansed, and partly incarned, the lint is to be lessened, and simple dressings continued till the whole wound is healed.

Albucasis describes the incision with the same exactness, and almost in the same terms; but he adds two very material circumstances; the first is, that, after this method of treatment, the Hydrocele is liable to return, the sac not being destroyed; and the other is, that the testis sometimes escapes out of the lips of the wound. Great care, he observes, should be taken to return it, and keep it in its place. This accident depends on the retraction of the sides of the skin, and of the membrane which contained the water; for the testis itself shews no disposition to  
leave



leave its original situation, and can only give way to the action of the parts which surround it: nevertheless, the precept which Albucasis gave is very important; and we meet with the same caution in other authors.

Since the end of the eleventh century, when he wrote, we find no mention of this method for a great length of time; practitioners recommended others, as, the cauterization of the sac, the use of the tent, and of the seton. Hildanus first resumed the cure by incision, and appears to have practised it; the sixty-sixth observation of the fourth century is a proof, and furnishes at the same time an example of the success which attended it. The patient was forty-five years of age, of a robust constitution; he had long been subject to a Hydrocele of such bulk as to be very incommodious to him. After the proper preparation, an incision was made

through the teguments, the tunica vaginalis was brought into view, and was then divided through the whole length: the cavity was filled with a large tent, which was placed the whole length of the testis to the bottom of the sac. The patient recovered. Hildanus observes, that this method should be used with great circumspection, as it is sometimes followed with serious consequences, which put the patient's life in most imminent danger.

This is not the only author who has seen bad consequences from the operation by the incision.

Dodonæus cites a case in which the incision was followed by gangrene, and caused the death of the patient.

Wiseman, one of the distinguished surgeons of the last century, observes, that it is often followed by colic, fever, hiccough, and gangrene, when the patient is of a delicate constitution.

Mr. Cheffelden, who was by no means a timid operator, says he has done the operation by incision, and seen it done by others; but never thought the cure worth the trouble and pain the patient must necessarily undergo.

According to Heister's account the *curatio perfecta*, by which he means the incision, confines the patient many weeks to his bed, is painful, and in some measure dangerous.

We find also instances, in the most modern authors, in which this operation has been the cause of very serious consequences.

Mr. Sharp, in his treatise on operations, relates two cases where the incision produced very dangerous accidents. The first is in a man of a robust and good constitution, whose Hydrocele was opened the length of four inches. In the evening, after the operation, he had a fever; the scrotum and testis began to inflame and tumefy; the patient felt severe

pains in the region of the loins: from the third day to the seventh he was in great danger till the suppuration appeared to be established, after which he grew better; but the testicle suppurated, and a large quantity of matter was formed. The discharge did not begin to diminish till the twenty-fourth day; adhesions were then formed between the testicle and the membranes of the scrotum, and the forty-third day the wound was entirely healed.

In the second case there was also a violent symptomatic fever, which terminated in an abscess in the testicle; the patient, who was only eight years old, very narrowly escaped with life.—On the whole, he concludes, that both incision and caustic are attended with so much danger, that, notwithstanding the success in the end, he believes whoever reads the cases will be inclined to reject both methods, and abide rather by the palliative  
cure;



cure ; and again, that he has known a few examples in favour of the operation, but by no means enough to warrant the recommendation of it, unless to such persons as are inconsolable under the disorder, and are willing to suffer any thing for a cure.

Mr. Warner observes he has never seen any fatal consequences arise from the incision ; but advises that it should only be practised upon those who are of a good habit of body, and who have not exceeded the middle stage of life.

The authorities which have been quoted are certainly adverse to the operation of incision ; but to treat it with that impartiality which I would wish to preserve, it is proper to remark, that it has been practised by surgeons of the first reputation and abilities, and that it is still preferred by some ingenious practitioners among the moderns to the seton or caustic.

Mr.

Mr. Bell, in his System of Surgery, after having enumerated all the methods which have been employed for the cure of the Hydrocele, has reduced them to three as now generally in use, the incision, caustic, and seton; of these he prefers the incision: but his account does not convey a very favourable impression of either of them, as he says “ he has seen all the three methods produce troublesome symptoms, such as great pain and tension of the abdomen, inflammation and fever: and again, if *either* of them be practised on persons otherwise diseased, on old people, or of infirm habits of body, the symptomatic fever is apt to run too high for the strength of the patient, and the supuration, produced by a high degree of inflammation, tends afterward to destroy entirely the remains of a constitution already much impaired.”

The same writer recommends the incision

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to be performed in cases where, from accident, the Hydrocele is burst, and the water is diffused in the cellular membrane under the scrotum: his words are, “ Instances of the scrotal anasarca of a local nature have also occurred from the rupture of the Hydrocele, of the tunica vaginalis testis; when this species of Hydrocele arrives at a great size, jumping from a height, or a violent blow or bruise of any kind, will readily burst it, and the water not finding a passage outwardly must necessarily diffuse itself over the whole scrotum. Different instances of this kind have been met with, two of which are related by Douglas; and the same kind of swelling has been produced by the water of a Hydrocele of the vaginal coat being improperly drawn off by the operation of tapping. When the orifice in the skin is allowed to recede from the opening into the vaginal coat before the water is all discharged,

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the remainder of the collection is very apt to diffuse itself through all the cellular substance of the scrotum.

“ In whichever of these ways the swelling is produced, the cure ought to consist in laying the tumor sufficiently open, not only for evacuating the diffused water, but for effecting a radical cure of the Hydrocele of the tunica vaginalis.”

Here I must take the liberty to observe, that I have seen and could enumerate many instances of the accident of large and much distended Hydroceles being burst by blows against the pommel of a saddle, by falls from horseback, and other causes. I have known several times the cannula of a trochar slip out of the tunica vaginalis, and permit the water to run into the cellular membrane under the scrotum; but I never saw a single instance of the kind where the extravasated fluid was not perfectly and totally absorbed,

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in a very small space of time, without the necessity of incision, puncture, or any other operation. After which the Hydrocele again increased, as if the palliative cure alone had been performed, and became by degrees fit for a radical operation. So that, if the incision in this case be used for evacuating the diffused water, I apprehend it to be wholly unnecessary: and if it be intended to effect a radical cure of the Hydrocele, while the tunica vaginalis is in a collapsed state, and the cellular membrane of the scrotum loaded with water, probably also inflamed by the distention, it must surely be a most improper time to undertake it; and I should conceive, few practitioners would think it right to perform such an operation under such circumstances.

When Mr. Pott first published on the Hydrocele, the incision was the most usual mode of obtaining its cure, and consequently came in for its full share of description in his  
general

general treatise on that complaint; from thence, however, it has been inferred, that he was the patron or adviser of that operation; but, though he gives an accurate account of the method of performing it, and prescribes the best means of avoiding the evils which frequently arise from it, whoever will carefully consider the whole of his account, must observe the caution with which he speaks on the subject, that he excludes the unhealthy and infirm, and only thinks it practicable on the young and vigorous; and he remarks, that it can never be said to be totally void of danger, and that it bears the appearance of an operation of some severity. On the whole, it clearly appears that he was not satisfied with it, and the fact is, that he did not perform it during the last twenty-six years of his life, in which time it has not been practised at St. Bartholomew's hospital.

I must confess I took an early and deep-

rooted dislike to the cure of Hydroceles by incision, which more mature observation and experience have not in the smallest degree removed, as I have constantly remarked it to be extremely severe in the execution, and that great tension, pain, and fever, are generally its immediate consequences; after which the progress of the cure is often slow and tedious, requiring in some cases, though under the care of the ablest practitioners, many months for its completion.

The bad symptoms which have attended this operation have been attributed to the difficulty with which membranous parts suppurate; on which account it has been advised to touch the tunica vaginalis with gentle escharotics, in order to bring on a suppuration. It has been also recommended to scarify it to promote its exfoliation.

That the operation of incision, according to the method in which it has been usually practised,

practised, may prove a radical cure of the Hydrocele, the whole interior surface of the sac must suppurate and granulate. That it is not calculated to procure an union by the first intention, as has been suggested, must be evident, for whether the cavity be filled with lint, farinaceous matter, or any other substance, the coats are equally prevented from immediate union; after which, the next process which nature adopts in order to unite contiguous parts must take place, and if the cavity be not filled up with granulations, or if any part remains which does not contract an adhesion to the testicle, a new collection of fluid may take place, and thus the complaint be renewed. Albucasis mentions the possibility of this, and it has been confirmed by the experience of the moderns. Many instances have been produced of this fact having happened after the wound has been healed. Mr. Sabatier

mentions

mentions a case in which a collection took place on each side of the cicatrix after it had been firmly established, and required to be let out by two incisions; and another instance in which the patient submitted twice to the operation by incision, which were both done by a very able surgeon; but the water collected again, and he was afterwards obliged to suffer the sides of the sac to be taken away before the cure was completed.

I have lately seen a gentleman, who underwent the incision in Ireland, in whom a collection of water was again formed in the same part, and such was his dread of what he had suffered from the operation, that he permitted it to increase to an enormous size before he would submit to any other means for his relief.



## EXCISION.

It is commonly supposed that the excision of the sac of a Hydrocele is as ancient as the incision. Celsus is said to have clearly described it. It is true that this author, after having recommended to take away a part of the bag in which the water is contained, says, if the complaint has its seat under one of the interior coats of the testicle, an incision through the scrotum should be made, to lay the tumor bare, and to extirpate it intire; at least this appears to be the meaning of the Latin text, which is not always perfectly intelligible—*si sub mediâ imâve tunicâ, totæ hæ extra scrotum collocandæ, excidendæque sunt.* But can Celsus mean that we should take away the whole of the tumor, and consequently that the testicle should at the same time be extirpated? or that we should only remove the membranes

membranes which serve for the coat or covering of the Hydrocele? This it is difficult to determine, but in another place he clearly recommends preserving the testicle. *Purgatus ita testiculus, per ipsam plagam cum venis & arteriis & nervo suo leniter demittendus est*, lib. vii. cap. 19 ; and still more particularly in a passage of the same chapter before quoted. On the whole, I am perfectly satisfied that Celsus means to dissect off as much of the sac, wheresoever it shall be situated, as can be done consistently with the preservation of the testicle, and expressly with a design to obliterate the cavity, that there may be no future lodgment for a fluid.—Galen, who followed him, is of opinion that the part affected should be taken away with the disease.—Albucasis appears to be the first who has unequivocally described the excision. When the teguments have been divided, he says we must dissect and open the

membrane, and let out the water, after which  
 “ incide syphac qualiter-cumque est possibile  
 tibi incidere ipsum aut cum totalitate sua, aut  
 frustatim, præcipue ejus latus subtile, nam si  
 non exquisitè perscruteris in incisione ejus non  
 fit securitas quin aqua redeat. Si autem  
 procedit ovum exterius a cute sua, in horâ  
 operationis tuæ, tunc, quando compleveris sec-  
 tionem syphac, reduc ipsum.”—This last cir-  
 cumstance is decisive; if the testicle is forced  
 out of its situation during the operation, it  
 should be replaced after having taken away  
 the membranous production which contained  
 the water. It is clear then that Albucasis did  
 not advise the extirpation of the testis, he  
 only prescribed the excision of the sides of  
 the bag which forms the Hydrocele.—Fallop-  
 ius recommends the same method, which he  
 mentions as an invention of an old date;  
 however he thinks it only applicable to par-  
 ticular Hydroceles.

Although



Although the excision is clearly described by Albucasis and Fallopius, it is not again taken notice of till we meet with it among the moderns; either it was not understood, or it was deemed too difficult and too cruel to be executed.

We find some of the French writers recommending the excision of part or the whole of the sac when it has been much distended or is much thickened and hard.

Mr. Douglas has asserted that the excision of the sac is the only method which ought to be used, if we are obliged to use a cutting instrument for the cure of the Hydrocele; he seems to have been determined in this opinion by the bad success which attended his first operation by the incision; his patient had very alarming symptoms, such as great pain, inflammation, fever, and a tumefied hardness of the cyst. These symptoms were not abated till the cyst was scari-

fied through its whole extent, and in a manner divided into slips. The separation of these small portions being easily accomplished, Mr. Douglas thought he should succeed better if he took away the whole of the cyst; he soon had an opportunity of trying this new method, and it was attended with all the success which he expected. The symptomatic fever which followed was less, the treatment more simple, the cure completed in less time, and a return of the complaint impossible. The method in which Mr. D. advises the operation is as follows: The patient being properly placed, two incisions were to be made in the scrotum forming an oval, and reaching from the upper to the lower part; this oval portion to be dissected off, after which an opening was to be made in the sac, and enlarged by scissars; the tunica vaginalis was then to be extirpated entirely, close to where it is connected with the spermatic vessels; an assist-

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ant supporting the testicle during the operation, and afterwards replacing it in its proper situation; the cavity is then directed to be filled with dry lint.—Mr. D. directs the oval piece of skin to be dissected off before the opening in the tunic was made, because he had been embarrassed in a former operation in which he had omitted it; the lips of the wound turning in, he was not able easily to get at the internal part of the tumor to dissect off the tunic; he recommends great caution not to injure the testicle or spermatic vessels.

This operation, though followed by Mr. White of Manchester, and many other surgeons of eminence and character, must have been tedious, and exquisitely painful in the performance; and, from the manner in which it was directed afterwards to be treated, must have been attended with violent and dangerous symptoms. Yet I am decidedly of opi-

nion, that the excision is less objectionable than the incision, provided it were necessary to *open the Hydrocele at all* in order to obtain its cure; but in that case I am also clear that the best method would be, after having removed the whole of the cyst, to bring the sides of the teguments into contact, and not to prevent their immediate union by any intervening substance whatever; by this method, that exquisitely sensible membrane the tunica albuginea would remain covered, and not be exposed to irritation from the air and from topical applications, which circumstances are the principal causes of the violent inflammatory symptoms which usually follow such exposure; but I hope to be able to prove, that such an operation is seldom, if ever necessary.

#### THE CAUSTIC.

SOME of the earliest practitioners were not content with simply dividing the sac of  
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the Hydrocele, in order to induce a suppuration of the membranes, and consequently an adhesion of the surrounding parts to the testicle; nor in taking away the membrane to prevent the possibility of a new collection: Some of them proposed to open the bag with the actual cautery. This is recommended by Paulus Egineta. In the operation which he describes, the skin is to be destroyed by a cautery of a particular form, the eschar which is left with the cellular membrane to be dissected away, a cautery of another shape is then to be applied to the membrane.

On the pain and horror attending such a process it is unnecessary to remark. Franco speaks of this method, but in a cursory manner.—Marcus Aurelius Severinus practised it; he says he performed it with success on a friar and a citizen of distinction in the town of Tarentum. The sensations of these unfortunate patients may be readily conceived,  
and



and humanity bids us hope their fellow sufferers were few.

The caustic appears to be of later date. Sabatier supposes Hildanus to have been the first author who takes notice of curing a Hydrocele by the application of a caustic. But it appears that, two hundred years prior to Hildanus, Guido de Cauliaco takes notice of the use of caustics in two different modes, one after the incision—Cum phlebotomo aperio & aquam extraho, deinde ad consumendum folliculum, modicum arseneci appono cum xylo & cotone & post casum æscharæ, consolido & firmiter sigillo, tract. 2d. doct. ii. cap. 7. He took this practice, he says, from Avicenna and Halyabbas; he then adds—Nonnulli vero, ut Magister Petrus de Orlhiaco, caustico & corrosivo super pectinem locum aperiunt usque ad didymi vacuitatem, postea perforando, ducendo caudam specilli usque ad locum aquæ, ipsam extrahunt, & post casum æscharæ

charæ consolidant & figillant, alii autem cauterio actuali predictam operationem perficiunt, ibid.

Wiseman made use of caustic for the same purpose ; he relates his having applied it to a very large Hydrocele, a copious quantity of water and bloody matter were discharged, the wound was dressed with a mild digestive: The following night the patient was attacked with fever and pain in the abdomen. The dressings were continued till the cyst entirely sloughed.—This patient had also a Hydrocele on the other side, which was divided with a cutting instrument; the symptoms were nearly equally violent till the sac digested off, which happened in about twelve days. The cure was sooner completed by the second process than by the first, and Wiseman observes, the suppuration of the cyst, so necessary for the radical cure, is not less certain by the incision than by the effect of the caustic.

Some

Some modern authors recommend the caustic for the radical cure of the Hydrocele. Dionis advises to apply a line of caustic the length of the tumor, and to cause the sac to suppurate; his commentator De la Faye is of a different opinion, and says, that the inconveniences which practitioners have experienced from the use of caustics, have caused them to be laid aside; but he does not specify of what nature those inconveniences were.

Garengéot mentions several objections to the use of caustics; he says the action of them is slow, and not sufficiently powerful, yet that they frequently are extended to a larger surface than is meant; that an instrument must afterwards be used to divide the eschar, and that the caustic particles sometimes mixing with the water of the Hydrocele, communicate their corroding qualities, and produce irreparable mischief. The last objection does not appear to have much weight,

weight, and indeed is completely contradicted by another practitioner, who recommends the application of a caustic the length of the tumor, then to divide the eschar down to the sac; after which he advises a fresh application of caustic to the sac, and does not fear any harm being communicated to the testicle, because so soon as the caustic meets with the water, its power and action are blunted and cease.

The application of a large caustic continued in use, for a considerable time, among many practitioners. Mr. Gooch succeeded equally in the cure of Hydroceles by removing an oval piece from the scrotum, and dissecting away the tunica vaginalis, as by the application of a caustic on the tumor; but, for reasons which he has assigned, he preferred the former.

Heister appears to have several times used it with success. — Sharp says he has seen material ill effects arise from it; he applied to a  
 large

large tumor a caustic, an inch broad and six inches long, the day after he divided the eschar and let out the water; from the third to the ninth day the patient complained of great pain in the part, in the back, and kidneys; the symptomatic fever was violent, and there was no sign of digestion in the wound. These symptoms more or less continued to the thirty-third day, when the patient grew better; but two abscesses were formed, which it was necessary to open. The patient got well in about sixty days. This case certainly does not tell in favour of caustics for the cure of Hydroceles, yet the greatest part of the bad symptoms related probably arose from dividing the eschar, and letting the air have access to the testicle; if the scrotum had been suffered to contract and throw off the sloughy membrane by degrees, these symptoms, if they had arisen at all, would have been much more moderate.



Cauterics have not always been employed with the same views ; instead of being used to open Hydroceles through their whole length, as is done by a cutting instrument, some have proposed to make a small opening in the middle of the tumor, sufficient to discharge the water, and to excite in the internal part of the sac an inflammation and supuration ; after which an adhesion would take place between the teguments and the testicle. This method has been practised a considerable time in this country. The late Mr. Elze has left a well written account of it. The method which he recommends is as follows : “ To lay a small caustic upon the anterior and inferior part of the scrotum, sufficiently large to produce an eschar about the size of a shilling, which is intended to affect, and, if possible, penetrate through the tunica vaginalis. Sometimes immediately after removing the caustic, sometimes within twelve

or twenty-four hours, the patient begins to complain of pain in the scrotum and loins, has now and then some cholic pains, the pulse a little quickened, and the tongue whitish; at different periods of time after removing the caustic, an alteration is perceptible in the scrotum; the tumor feels more tense or hard, in a few days the eschar of the scrotum will loosen and come away, exposing to view the tunica vaginalis, which bears evident marks of its having been affected by the caustic, and being prepared to slough off. As the cure proceeds, the sloughy tunica vaginalis will project more through the orifice in the scrotum; if the water be discharged by puncture, the scrotum by degrees collapses, and the orifice in it is filled up with slough, which prevents the access of external air to the testicle. These sloughs continue to come away with the dressings daily, for about *four, five, or six weeks*, and in proportion

proportion to their discharge the hard tumor of the scrotum lessens. Whoever will carefully attend to the several appearances that accompany this method, must be satisfied that the caustic excites an inflammation of the tunica vaginalis, which spreads through the whole of it, in consequence of which the *entire membrane suppurates and comes away in sloughs.*"

This method was certainly a great improvement on the former manner of applying the caustic; by not dividing the eschar, and no air being admitted, the inflammation was not violent; but, though preferable to many of the other operations, it appears to be in itself extremely exceptionable, as it causes an unnecessary destruction of the parts, and produces a tedious, painful, and offensive sore: for it is evident, from the passage which I have quoted, that it was Mr. Else's intention, and he generally succeeded in it, to

produce a complete flough of the whole tunica vaginalis.

#### THE TENT.

THE use of the tent for the cure of Hydroceles is not of very old date. It occurs first in the works of Franco, who seems to have had great confidence in it. An opening he recommends to be made in the scrotum of two or three inches; but the length of the incision must depend on the age of the patient and the size of the tumor. This wound, he observes, must be kept open with a tent of lint, linen, or sponge; the larger the opening, and the longer time it takes to heal, the greater is the certainty of the complaint not returning.

Pare, describing the same method, speaks of it as having been successfully used by some; but which himself had not practised, as indeed is evident from the indistinct and imperfect

account of it which he has given. He appears to prefer the seton.

The method of using the tent is described by Guillemeau in this manner—The tumor is to be opened in its upper part by a right line, the incision should not be large, and should penetrate into the cavity where the water is collected, great care being taken not to injure the testis or the spermatic vessels; the tent is then to be introduced.—The opening he advised to be made in the upper part of the tumor, as least likely in that part to injure the spermatic vessels; but this practice probably arose from an idea, that the water of the Hydrocele came from the abdomen, and found a passage by the spermatic vessels, and that the cicatrix in that part would prevent its reproduction. If this method be followed, water and matter must be collected at the bottom of the tumor.

Covillard, in his account of the different



methods of curing the Hydrocele, does not forget the tent; he first speaks of the place where the incision ought to be made; Paulus Egineta and Celsus, he says, advise it to be done from the middle of the scrotum to the groin; while Avicenna and Gulielmus e Saliceto wish it to be made in the lower part. Here he appears to be rather mistaken, as neither of those authors say a word on the subject of the tent. Covillard indeed recommends the incision to be made nearly the length of the tumor, and to take away part of the cyst, by which means his operation did not greatly differ from the incision which was practised by the authors he has quoted; he then advises to apply a large and long tent of lint, and, to prevent any return of the complaint, the wound is to be kept open a considerable time by means of tents armed with digestives: he concludes with saying this method of operating is very certain, but

is not free from danger in some habits, and may be followed with inflammation and gangrene.

The tent was in use at the time of Nuck; it was then the most common operation. Ruysh, his compatriot and contemporary, speaks of it in the most positive manner; and shews that he had particular experience of it; he says, when a Hydrocele is opened by a trochar, or lancet, the tumor soon appears again: but, if an opening be made in the scrotum in the upper part and on one side, and a tent is introduced covered with ointment mixed with red precipitate, till a gentle inflammation, followed by a moderate suppuration, has rotted the membrane in which the water is contained; and, if this membrane be taken away piecemeal, he observes, it is a perfect cure, as he has several times experienced. The authority of Ruysh, who was well acquainted with surgical business, and

held a distinguished rank among anatomists, is not to be disregarded; yet how can we conceive success to have followed if the incision was made in the upper and lateral part of the Hydrocele? Is it not probable that a collection of matter must have been formed in the lower part of the tumor, from which there could have been no depending opening by the wound, as it was directed to be made?

Modern instances might be brought of violent inflammatory symptoms following such practice, attended with mortification, and even a fatal termination. If the tent be used, the opening for it should undoubtedly be made in the lower part of the scrotum; one of the first and most useful principles in surgery is to gain a depending opening for matter, or any fluid which we wish to discharge, and is particularly applicable in this case, where a contrary practice must be productive of the  
worst

worst consequences from the extreme irritability of the parts concerned.

Other authors have recommended the tent with little variation, so that it is obvious that the use of the tent for the cure of Hydroceles was long practised. It does not, however, appear to have been in use among the French surgeons before the middle of the sixteenth century, and I do not find it after the beginning of the present, except in Heister, who rather describes than advises the operation; but, if it was abandoned by the French, it continued to be the practice of the Italians, as it is much recommended in a work intitled, *Pratica delle piu difficili operazioni di chirurgia che riguardano il Lithomomo e l'occulista*; printed at Rome 1723, in octavo. This is the work of Jerome Marini, and, if we take the opinion of Haller, is a very moderate composition. Marini adds nothing to the manner of using the tent, except that it

should be armed with medicaments of different qualities, according to the different states of the treatment.

Dr. Monro, in later times, conceived a process which had some analogy to the use of the tent. This was to irritate the anterior part of the sac by leaving the cannula some time within the cavity, but the consequences of them were very different; the tent was intended to cause a suppuration of the sac, and the external surface of the testicle, at least the tunica albuginea. On the contrary, the intention of Dr. Monro was only to excite such an inflammation as might be followed by a cohesion of the parts; as he had often seen Hydroceles cured, in a manner spontaneously, by an inflammation which was accidentally produced, he conceived he might bring about such an inflammation by art; but he was aware that this must require great care, and that



that the surgeon should always be able to regulate the degree of inflammation; he therefore rejected irritating remedies, of which he could not immediately prevent the effect. He thought he should succeed better by the cannula of a trochar left in after the evacuation of the water, as the cause of irritation might be removed whenever it was thought that sufficient inflammation was produced. Monro never practised this plan himself, and he recommends it with great diffidence; the hint, however, was sufficient to induce Mr. Pott to try it, and to ground on it his operation of the seton.

Perhaps Monro's plan may be traced in Fabricius ab Aquapendente; after having advanced that the Hydrocele is sometimes cured by a simple incision in the lower part, although it be suffered to close again immediately, Fabricius adds, that some practitioners keep the incision open during some days

with a cannula of silver; undoubtedly they only proposed to preserve an opening by which the water, if any should collect, might find a free exit; but every one must see that a cannula remaining in the cavity of the tunica vaginalis for some days, must rub and fret the testis, and the inside of the tunica vaginalis, and bring on an inflammation. If we believe Fallopius, Galen has advised to leave a cannula in the sac of a Hydrocele during some days; but on consulting the works of that author in the place quoted, there is no expression sufficiently precise to determine that to have been his intention.

This method has not much obtained in practice; Mr. Pott tried it, and assures us that it was not followed by bad consequences: he only observed that the presence of the cannula was very inconvenient, and that the inflexibility of it hurt the testis when the patient moved with inattention. The tent and bougie

bougie which he substituted in its place were not nearly so incommodious, but the effects produced by them were very uncertain; and, on the whole, he was of opinion, that it was not to be depended on.

Mr. Warner made some trials of the tent, of which he has related four cases; in the first he introduced a piece of sponge which continued twenty-four hours without producing any sensible effect, and was suffered to remain to the third day, when the scrotum became hard and inflamed; the fourth day a small quantity of matter transuded; this discharge continued to increase during ten days, after which a little abscess formed which furnished some matter, the discharge then diminished, and the membranes contracted an adhesion to the testis.

This is the most favourable case which Mr. Warner has recited, and he pronounces it an easy, safe, and simple cure; but we  
must

must remark that there was an abscess formed, which was opened by an incision.—In the second case the inflammation rose to a much greater height; the third day after the operation the patient had sickness, attended with vomiting and fever; the fifteenth or sixteenth day the scrotum burst in two places near the original puncture, from which openings there issued a considerable quantity of matter mixed with a flough.—In the third instance the patient was attacked with a rigor on the eleventh day, the inflammation increased to a great degree, and matter was formed which burst its way through the scrotum; yet, notwithstanding the violence of the inflammatory symptoms, there appears to have been a beginning fresh collection of lymph in a portion of the tunic which had escaped the inflammation. — In the fourth case the symptoms were not much more favourable, the scrotum imposthumated and burst,

burst, and a great deal of fetid matter was discharged.

As this is a method which I have never practised, I have been more particular in relating the practice and opinions of others; and, from what may be fairly collected from the general account, I conceive the operation does not stand in a very favourable light.

#### THE SETON.

No traces of the use of the seton for the cure of Hydroceles are to be found among the ancients; this remedy, which was invented by the Arabians, was not applied to this disease till after the time in which they wrote. The first mention of it is in a work of Guido de Cauliaco in 1363; he says the Hydrocele may be emptied by means of a seton, which may be done in this manner: the tumor is to be taken hold of by a pair of forceps, flat and pierced with an opening  
near



near the ends of the blades ; through these a needle is to be passed, carrying a seton, which is to be left behind until the water is entirely evacuated.

Fallopius speaks of this method as new, but does not approve of the forceps recommended by Guido ; he thinks it sufficient to pierce through the Hydrocele with a proper needle. Fabricius ab Aquapendente also mentions the seton, though he does not suppose it likely to produce a radical cure in every case.

We meet with the same doubts of the certainty of success from this operation in a Treatise on Herniæ by Franco. This author asserts that the most certain method is to extirpate the cyst along with the testicle, or, in other words, to castrate, as after any other operation the tumor is subject to return at the end of five or six months or sooner. The manner in which he advises the seton to be

be passed is the same which is mentioned by Guido and Fallopius, and says it may be done either with the forceps, through which the needle may be passed, or the needle may be used alone ; but then it must be curved. When the first method is used the needle should be made red hot, and passed quickly, that it may not cool in traversing from one opening to the other. Sometimes it is necessary to use the other method, as, when the bag is very full and much distended, the forceps would require to be pinched with too great force in order to bring the blades sufficiently close, and he observes that no means ought to be neglected to prevent inflammation ; if it rises too high the seton must be removed, if not, the seton is to be only moved every day, to favour the discharge of the water. Notwithstanding the strange awkwardness and inconvenience of conveying a seton by means of the forceps,

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it was the method which Pare made use of, and appears to have been his common practice, as it is the first of which he has given a description.

The seton, though not generally adopted, continued in use in the time of Covillard ; it was conveyed by means of a needle half a foot in length, the point heated red-hot, and carrying silk nine or ten times double ; he prefers this method, because it is often difficult, from the size of the tumor, to make the holes in the blades of the forceps meet ; but says this method is not always successful, owing to the inflammation of the openings not permitting the water to find a passage out. Other authors speak of the uncertainty of the success of the seton as a radical cure, but recommend it as a palliative cure in Hydroceles of the tunica vaginalis ; others think it only applicable where the water is diffused through the cellular membrane.

Heister

Heister, the faithful reporter of all the methods of operating which are known to him, in treating of the radical cure of the Hydrocele, does not omit the seton ; he describes it as done with a needle ; but adds, that the seton should be imbued with digestive and caustic medicines, and advises it to be suffered to continue in the sac a month, as the former failure of success he ascribes to not letting it remain long enough, by which, sufficient inflammation was not excited to produce the adhesion of the membranes with the testicle : but, as by this process a knowledge of the state of the testicle is not procured, he says, practitioners in general prefer other methods.

The objections which Heister made are the same which since occurred to Mr. Douglas :—he observes, that it is not necessary to insist further on the use of the seton, for, besides that the application of it is extremely

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painful,

painful, it does not produce a suppuration of the cyst, and gives no opportunity of knowing the state of the testicle; the action of it also is so slow, and productive of so much irritation, that he does not think it an advisable operation.

The disadvantageous light in which almost all the practitioners had left this method, did not prevent Mr. Pott from making trial of, and adopting it. The disgust which he had conceived for the painful operation of incision, and the unnecessary destruction of the sac, even in the best way of employing the caustic, led him to endeavour to steer clear of both, by a method which should not be painful in the execution, and should only procure an adhesion of those parts which the caustic made necessary to come away. Having prosecuted Monro's idea of letting the cannula remain, Mr. Pott was convinced that a foreign body might be endured within the tunica vaginalis without



without risk or danger ; but, as the cannula was found inconvenient and troublesome, he was induced to substitute the seton, which was calculated to lie smoother and softer.—I attended his first essays, which were as follow :—After having pierced the Hydrocele with a middle sized trochar in the lower part, and let out the water, he introduced through the cannula, an eye-probe, carrying a seton of ten or twelve threads of candlewick cotton ; he passed this probe the whole length of the sac against the upper part, and there, on the blunt end of the probe, made an incision sufficient to let it out with the seton which it conveyed ; he then cut off the seton close to the probe, and tied the two ends of it loosely together ; the wounds were covered with a pledget. The morning after, the seton was found to have contracted such firm adhesion to the inside of the sac and the tunica albuginea, that an endeavour to detach it would

have caused great pain; but this was not necessary, as, while untouched, it remained without any inconvenience to the part.

In less than twenty-four hours after the operation the scrotum and testicle began to inflame, and put on the appearance of a hernia humoralis, and was treated in the same manner as is usual in that complaint, with fomentation and poultices, and supported in a bag-truss; attention being paid to keep the patient cool.

The adhesion of the seton to the albuginea continuing firm, it was not meddled with, till, the inflammation lessening and the tumor subsiding, it became loose. This was generally in about a fortnight; by this time the parts had contracted a firm and solid cohesion; the seton was then withdrawn, and the orifices healed with a superficial pledget.

Mr. Pott practised this method on many persons, and succeeded very well. The patients

tients kept their beds a few days, after which they sat on a couch till the cure was complete, which was usually in three or four weeks ; during which time no other regimen was necessary, than an inflammation of the parts from any other cause would require. However, Mr. Pott soon discovered that the manner of performing the operation might be improved ; he found that it was extremely difficult to cut on the end of the probe which carried the seton, and required the assistance of another person. He remarked that the cotton passed with difficulty, and by rubbing on the tunica albuginea gave pain ; that the seton, being made of cotton, adhered in some instances too long and too firmly ; that, from the intimate union of its parts with each other, it could not be brought away but entire, which unnecessarily prolonged the cure, and in two cases it was necessary to make an incision to set it free.

These inconveniencies led him to change his plan, and were completely obviated by the instruments he latterly made use of. Mr. Pott was always averse to multiply instruments in any operation, but in this he found it necessary to make use of three; the first was a trochar, the dimension of whose cannula was about one fourth of an inch; another cannula, called the seton-cannula, made of silver, of such diameter as just easily to pass through the cannula of the trochar, its length five inches, and a probe six inches one half long, having at one extremity a fine steel trochar point, and at the other, an eye which carried the seton; which seton consisted of just so much strong coarse white sewing silk as would without difficulty pass the cannula, but at the same time would fill it. Of late years he made use of a much smaller seton, and found it to answer the purpose better, giving more room to the discharge of any fluid

fluid which might be collected, and being more easily removed at the proper time.

With the trochar the inferior and anterior part of the tumor was to be pierced, as in the palliative operation. As soon as the perforator was withdrawn, and the water discharged, the seton-cannula was passed through that of the trochar, until it reached the upper part of the tunica vaginalis, and was felt in the upper part of the scrotum; this done, the probe armed with its seton was conveyed through the latter cannula, the vaginal coat and integuments were pierced by its point, and the seton was drawn through the cannula until a sufficient quantity was brought out by the upper orifice; the two cannulas were then withdrawn, and the operation was finished. It was executed in two or three seconds of time, and with little more pain than is felt in the palliative operation.

By this method every advantage of the



former operation is retained, and every inconvenience which it was liable to is removed : the seton cannula, by its firmness, bears hard against the place where the seton should be brought out ; the trochar point of the probe is prevented from deviating by its confinement, and its point pierces through the skin immediately, and exactly in the place intended ; while the seton, by passing through the cannula, is prevented from rubbing rudely over the testicle.

The symptoms, which this manner of placing the seton caused, were nearly such as followed the former method, and required the same treatment. When the swelling was diminished, and the parts regaining their natural state, which happened about the tenth or twelfth day, the seton was gradually removed ; the adhesion always made some force necessary to bring it away, but a few only of the threads being withdrawn at a time,

time, the adhesive resistance was small; the dressings were, as before directed, a pledget over the whole scrotum.

I have been induced thus fully to relate Mr. Pott's plan, as I find it has been sometimes either not understood, or not sufficiently attended to; some persons, though intending to pursue the same idea, having acted very differently from his directions, and others having advised alterations which, in fact, are a total subversion of its principles.

The process which he recommends must be allowed to have been carried to a great degree of perfection, and, if the operation be performed without deviating from the directions he has laid down, I am convinced it will be found preferable to any of the methods which have been usually practised in this country. I had opportunities of seeing many of these cases with him, and have myself often practised it; but do not recollect  
more

more than two instances in which the seton failed to produce a cure. I must therefore conclude, that the want of success which has been attributed to it, must have arisen from a misapprehension of the proper manner of conducting it; particularly I must remark a great mistake which has been made in treating it like a common seton, by *drawing it upwards and downwards once or twice a day*, and which is the more likely to mislead others as it is recommended by a modern writer of considerable reputation. If we take into consideration the nature and texture of the parts which are to be thus rudely treated; that there is no gland or viscus in the human frame so susceptible of inflammation, and which swells instantaneously to a greater degree, such treatment must appear likely to produce exquisite pain and irritation.

I must also take the liberty to reply to  
some

some objections, which Mr. Bell has made to the seton ; one of which is, that it does not give an opportunity of examining the state of the testicle. I am at a loss to know what better information of its state any man of science would desire, than he could acquire by the touch, after the water is evacuated, which is always done previous to the introduction of the seton when the operation is *properly performed*; but not, when the trochar is passed into the upper part of the tumor, as Mr. Bell recommends, from having found difficulty in passing the seton needle, while the vaginal coat is in a collapsed state.—If Mr. Bell had introduced the seton-cannula, which Mr. Pott has described, I apprehend he would have found no such difficulty.

By the trochar being introduced at the lower part, the bag is completely emptied, and the testicle is submitted to the most perfect and satisfactory examination; not to

mention that the palliative cure is, or ought to be, in general performed at least once prior to any radical cure being attempted, which gives an additional opportunity of forming our opinion of it. It would be unfortunate indeed for mankind, if it were necessary to divide the scrotum, and lay bare every testicle which requires examination, before we could determine whether it be or be not diseased.

Another objection which this gentleman has made, and has given as a reason why the seton should be entirely set aside is, that it is ill suited for evacuating hydatids: his precise words are, “ It *frequently* happens that the water of a hydrocele *is contained in a number of hydatids*; a circumstance which cannot be discovered previous to the opening of the tumor. And as it will be readily admitted that the method of cure by seton is ill suited for evacuating hydatids, this of itself

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is a very material objection to the practice. So that upon the whole, although the seton in every other respect should be equally eligible with the simple incision, which, for the reasons formerly given, I think it is not, yet the two last objections we have adduced are sufficient reasons for *setting it entirely aside.*" That hydatids are sometimes formed in various parts of the body must be allowed; but I will appeal to any man of experience, whether they frequently happen in the tunica vaginalis. During near thirty years attendance at a large hospital, besides the private practice of Mr. Pott and myself, I may presume that as great a variety of Hydroceles have reached my notice as most individuals have seen; yet I do not recollect a single instance of hydatids in the Hydrocele, though I have often met with them *floating in* collections of fluid in the abdomen, in the thorax, under the fascia of the thigh, and in other parts; but

but granting that instances of the kind may happen, such particular cases might require an incision to let out hydatids which would not pass through a cannula; but that an operation, recommended by one of the ablest Surgeons who has ever practised in this or any other country, should be entirely set aside on account of a deficiency in demonstrating that which it palpably points out, or the possibility of the occurrence of a phenomenon, does not appear to me extremely reasonable.

The operation, as Mr. Pott practised it, stands on the most rational ground. The whole of his end and aim being to produce a cohesion without destroying the tunic, or causing it to slough. This the seton certainly effected; but it must be observed that it went beyond the intention; being a solid body, an adhesion also took place between that and the part of the sac with which it was in contact, and a suppuration,

suppuration; at least in the track of it, became necessary to loosen so as to make it capable of being removed; add to this, that it was certainly productive of more inflammation than was requisite for the cohesion of the tunics, by which fever was sometimes produced, and abscesses were sometimes formed; and that the matter which was collected and discharged was always peculiarly offensive, owing to the putrid disposition it received from the air, which found a ready entrance through the orifices made by the seton.

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WHOEVER considers what has been related, must observe, that all the methods usually employed to obtain a radical cure of the Hydrocele, when they have proved effectual, have been generally attended with great inconveniences, and sometimes with very alarming danger, both to the functions of the diseased

diseased part and to the life of the patient ; and all this risk and danger were incurred to get rid of a complaint in which neither life nor general health were materially interested. No man can reflect on these circumstances without wishing that it were possible to obtain the end by a milder process.

It is obvious that the inflammation is carried too far by continued irritation, and that, if the just and proper inflammation was raised by a cause which could be immediately removed, it must be preferable to letting any irritating foreign body remain, to be cast off by a further process, after the original intention, that of exciting merely an adhesive inflammation, had been answered ; and it must be evident to every man of common understanding, that after the inflammation has completely taken place over the surface of the tunica vaginalis, that the continuation of the cause of it must be not only useless but highly prejudicial.

Impressed

Impressed with these ideas, I turned my thoughts to fluids, as alone being capable of causing an immediate irritation, without the necessity of their lodging and remaining in contact with such inflammable surfaces; the only difficulty remained in selecting the proper fluid, which should do the business effectually, yet moderately:

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#### INJECTIONS.

On further investigation, I do not find that injections for the cure of the Hydrocele were in use among the early practitioners; nor have I been able to trace any account of them till of late years.

Dr. Monro attributes the first use of injection for this purpose to an army surgeon of his own name. Mr. Monro first made use of spirits of wine, which cured the complaint; but the inflammation was so violent

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that he thought it expedient to try a milder injection; he accordingly substituted wine, which answered the purpose as well, with less violence: but what the quantity was, or how the injection was used, that is, how long it was suffered to remain in the sac, does not appear.

Mr. Sharp, in his treatise on operations, relates a cure of a Hydrocele, which was attempted with sp. vin. but was not attained without danger. The pain which immediately followed the operation was violent, and continued to increase to the day after, when the tumor became hardened and swelled to a great degree. After remaining a month, it terminated in two abscesses on the anterior part of the scrotum. Mr. Sharp had been induced to make this trial, but he does not appear to have repeated it, nor do we find any thing relative to it in his critical enquiry on the state of surgery, published more than ten years after, which

is a sort of proof that it was not practised in England at that time. Indeed the greater part of the English authors who have written professedly on the different methods of curing the Hydrocele do not mention it. Mr. Douglas speaks of it only to shew his disapprobation of the practice ; he says that the vaginal coat is at such a distance, and the surface of the testicle so unequal, owing to the epididymis, that it seems impossible that these two parts should touch with exactness. Le Dran conceives that injections cannot succeed, because it would be impossible to bring the sides of the cyst together so as to touch, and besides that, the process would be liable to bring on inflammation. These reasons, particularly the last, had no weight with me, because it is the very circumstance which is to make the cure.

Mr. Pott also, in his treatise on the Hydrocele, ranked injections among those opera-

tions which, “happily for mankind, were laid aside.” From the deference, which I had always, with great reason, paid to his experience and abilities, this, I confess, was discouraging; but I have now the satisfaction to say that he lived to alter his opinion on the subject, and that it was his intention to have made trial of them.

As I had frequently succeeded in procuring an adhesion and consolidation of parts in sinuses and other large cavities, by injections of various kinds, without causing great inflammation, and had by those means avoided the necessity of the destruction, or extensive divisions of the skin and integuments, which should be avoided as much as possible, not only in the neck and face, or where we particularly wish to preserve beauty, but in every part, as the loss of true skin is never perfectly restored; I conceived the cure of Hydroceles might be effected by the same gentle

gentle means, without deranging, in any great degree, the tender and sensible organs which are the seat of the disease, and I was determined to make the experiment. While considering the best method of effecting my purpose, I was not a little pleased to find by Mr. Sabatier's account, that though injections had been neglected in England, they had been often used in France, and I learned that experiments had been made on a great variety of injections; that ardent spirits and solution of caustic had been tried, which had caused great inflammation and much mischief; but that more mild injections had been used with success.

The proper object of all attempts to cure the Hydrocele without destruction of the sac, is to produce such adhesion of the distended vaginal coat of the testis to the gland, as shall annihilate the cavity in which the water constituting the disease is contained. We know that this effect is produced

by a certain degree of inflammation, and are unacquainted with any other process, either natural or artificial, by which it can be brought about.

Injections introduced within the tunica vaginalis, into the urethra, or into any cavity of the body, natural, or formed by disease, are certainly capable of doing mischief; but the mischief must arise from the nature of the injection: if it be violent or irritating it may produce too great inflammation. The caustic and highly stimulating injections which had been most injudiciously made use of, and retained an unnecessary length of time, undoubtedly did harm, and were the cause of bringing injections in general, and for the cure of Hydroceles in particular, into discredit; but it is extremely absurd to infer from such instances, that all kinds of injections must be pernicious. If Mr. Sharp, instead of being alarmed at the bad symptoms which



which succeeded the use of spirits of wine, had diluted it, he would probably not so easily have decided against injections. In the use of injections we are not limited to any degree of stimulus. Injections may certainly be prepared so corrosive as to inflame, and even to dissolve the most indolent parts; on the contrary, they may be used so bland as not to offend the most sensible membrane or surface in the human body, and they may be made to produce any intermediate effect. There is no kind of stimulus which admits of such various modifications.

Other great advantages of injections are, that they apply themselves equally and universally over the whole cavity into which they are thrown, and when they have remained long enough to produce the requisite stimulus, they are easily and completely discharged. These are essential effects which cannot be derived from any solid body.

The injection, which after some consideration I fixed on for the purpose, was wine, which I made choice of for several reasons. I found that it had been used with success in France; I had experienced it to answer well in procuring adhesions in other parts. The strength of wine is never so great as to render it an unsafe remedy, and it may be readily lowered according to the different sensibility of the parts. Thus a vinous injection appeared capable of producing all the good effects which could be desired, with scarce a possibility of doing harm. The success which has attended it has more than answered my expectation, and from every trial which I have made, I have no reason to wish for a different one. The pain which is produced is incomparably less than by any other operation; it does nothing more than is intended, and the curative effect, as far as my experiments have gone, is equally certain.

In my edition of Mr. Pott's works was introduced a circumstantial account of all the experiments I had then made on the subject of injections for the cure of the Hydrocele. As practice is best illustrated by examples, they will be here repeated; and the method being rather new in this country, requiring therefore all the light which experience can throw on it, such further cases and observations as have since fallen within my notice will be added.

### CASE I.

A MAN, about fifty years of age, was taken into St. Bartholomew's hospital with a large Hydrocele of many years standing. June 21, 1787, in the presence of Mr. Pott, I passed into it a trochar, and let out a very large quantity of fluid of the usual colour and consistence. I found the tunica vaginalis remarkably

remarkably thickened and unpliant; to the feel not unlike tripe, or buff leather: the testicle was much larger than the natural size. On considering every circumstance, it appeared to be a very unfavourable case for any operation except the palliative: however, as I was desirous to try the effect of injection, and there was no probability of doing mischief, I filled it with port wine diluted with a decoction of red rose leaves. The man felt not the smallest pain; after retaining it a few minutes, I suffered it to be discharged. The next day a small degree of inflammation had taken place; the third day from the operation it was increased, and the whole scrotum considerably swollen: the patient continued absolutely free from pain and fever. By way of precaution a poultice was applied, and he took an opening draught. On the sixth day the inflammation continued, the scrotum much swollen,

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the patient without any other complaint. In a few days the inflammation lessened, but the scrotum was almost as large as before the operation, and, to all appearance, it now contained a fluid. It seemed extraordinary that water should be again secreted and collected in so very short a time; yet, as it was not attended with any pain or inflammation, I concluded that it was possible; and, being the first attempt which I had made, I was rather inclined to think, with every one who had seen it, that the injection had failed, and that there was a fresh accumulation of water. Accordingly it was agreed that the operation by the seton should be performed. Saturday, July 8th, he was brought into the theatre for that purpose; when, on examination, it appearing to Mr. Pott and all who were present that the size of the tumor was lessened, he was sent back to his ward. From that time the tumor

continued



continued gradually to diminish till the testicle was plainly perceptible, surrounded by the thickened tunica vaginalis. July 18 I examined with attention, and found it not only perfectly free from any fresh accumulation of fluid, but the testicle less in size than when I first let out the water; and the patient being well in every respect, I discharged him.

On considering all these circumstances I conceived that, if the method succeeded so well in this case, in which, from the size of the tumor, the duration of it, and the thickness of the vaginal coat, I had despaired of effecting a cure, there was every thing to hope from it in more favourable and more recent ones, and that it was infinitely preferable in every respect to any other operation I had ever seen attempted for the cure of Hydroceles. No pain, no violent irritation, nor fever succeeded; a gentle inflammation

tion only took place, attended with a moderate tumefaction, just sufficient to produce an adhesion of the tunica vaginalis to the testis, without the tedious process of suppuration, which, in some degree, is always the consequence of any other operation.

## C A S E II.

THE next case which occurred to me was in June 1787, in the person of a gentleman, who shewed me a Hydrocele which he said had gradually been increasing during several months. The integuments were remarkably thin, and in every respect it was the reverse of the case just described. He wished to have the radical cure performed, and it appeared a very good subject for an operation. As he was a man of excellent understanding, and had applied his thoughts to surgical cases, and more particularly to this which most

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materially

materially concerned himself, I described to him all the different operations which have been recommended for the cure of it, and pointed out what appeared to me their advantages and disadvantages, that he might form some judgment, and choose which he would submit to. He decided in favour of injection. After having evacuated about five ounces of yellowish fluid the testis felt larger than natural, but soft; I then threw in some injection more diluted than in the preceding case. He complained of some pain, on which account, after the injection had continued one minute, I suffered it to be discharged, and the pain soon ceased; when, lest I should not have done quite enough, I attempted to throw in some more, but air had got into the syringe, and I was rather foiled; however some went in, on which he again complained of pain, and I again discharged it, and withdrew the cannula.

nula. He continued to feel a small degree of uneasiness, and went to bed. I saw him again in the evening, when he told me the pain had gradually subsided, and that he was then perfectly easy. I ordered a fomentation and poultice to the part, and an opening draught. The next morning a very gentle inflammation had taken place, the parts were moderately tumefied, and he felt very little uneasiness. The third day, being much the same, he chose to get up; the fourth day, encouraged by ease and favourable accompaniments, he very imprudently exerted himself in moving a heavy table, by which he brought on his pain again, and the scrotum looked larger and more inflamed. This fresh access was fortunately soon calmed, and the parts again gradually subsided; and, though he continued to sit up, in nine days from the operation the gland bore to be examined as well as a sound testicle. In a few days after,

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the inflammation was entirely gone; and, what appeared a circumstance very much in favour of this operation, as it is contrary to what happens after, I believe I may say, every other operation for this complaint, the testicle was become perceptibly, to the patient as well as to myself, smaller than when I let out the water. Every one must allow that, after operations by which a solid foreign body is suffered to remain within the tunica vaginalis, the testis for a long time remains enlarged, owing to the great and unnecessary quantity of inflammation excited, and to the duration of it. A fluid may undoubtedly be made so powerful, and retained so long, as to produce the same ill effects; I must therefore observe that the success of the method which I am describing will probably be found to depend on two circumstances; the mildness of the injection, and the very short space of time which



which I have proved to be sufficient for its retention.

Finding himself perfectly well, he went to his country-house, where he caught cold, by remaining in his garden after rain, and had a very severe attack of fever; but notwithstanding; the testis continued perfectly quiet and easy. May 20th, in the following year, I had an opportunity of seeing him again; when, on a careful examination of the parts, I was convinced that the testis was become of its natural size, that an adhesion had universally taken place between the tunics, and, in short, that the cure was complete. I have had many opportunities of seeing him since, and he remains perfectly well.

### CASE III.

NOVEMBER 23, 1787, a young man shewed me a swelling of the scrotum, of a few  
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months duration, which I perceived to be a Hydrocele. After proper evacuations, I determined to attempt the cure by injection; I drew off a large tea-cup of straw-coloured water, and found the testis rather enlarged, as usual, but free from disease: I immediately filled the cavity with injection, which was kept in a couple of minutes; the patient complaining of some pain shooting up to his loins, it was discharged, and he went to bed. The next day I found him free from fever; he said, he had felt some pain similar to what he had felt during the operation; but the inflammation was not more than to be desired; the scrotum gently distended, with a scarlet blush. I ordered a poultice and bag-truss, and advised him, what I always recommend, not to suffer the scrotum to fall down between the thighs, but to support it by a small pillow, or by keeping the knees close. The 26th, the inflammation

inflammation was very moderate, he had no pain, nor had felt any since the second day; it continued gently to increase, and seemed about its height on the 28th, the fifth from the operation: and two days after, it appeared to be gradually decreasing; the patient during the whole time being entirely free from pain. December 4, the inflammation was diminished, the tumor about half its original size. On the 10th, the seventeenth from the operation, all inflammation had left it, the adhesion of the membranes appeared complete, and the testis in a perfectly quiet state.

#### C A S E IV.

ON the same day that I injected the last mentioned Hydrocele, another case, exactly similar in every respect, was put under my care; the age of the man nearly equal; his

constitution, the duration and size of his complaint, as nearly resembling the other as possible. To give a fair trial to both methods, I passed a seton in this; the complaint proceeded very well, with moderate inflammation: the seton was gradually removed, thread by thread, as they became loose; in about ten days the scrotum began to lessen and collapse; a small abscess however was formed, the matter of which emptied itself by the lower orifice. On the whole, this case gave as little trouble, and ended as happily as the mode of treating it generally does. But I must most truly confess that it did not seem comparable to the other, in which the inflammation was more moderate, the duration of it less, and no abscess was formed.

## CASE V.

MARCH 12, 1788, in company with the late Mr. PITTS, I let out the water from the Hydrocele of an elderly man, which had been tapped about five years before. It appeared large before the operation; but the quantity of water which was evacuated, and which measured considerably more than a pint, proved the cavity to have been more capacious than we had apprehended. The testicle was in a sound state, very little larger than natural; I threw in some injection, the patient felt no pain, and scarcely any extraordinary sensation, which induced me to use the remainder of the injection of a stronger quality, and to keep it in longer than usual. I had not enough to fill the cavity; however, by handling and altering the position of the parts, I caused it to be diffused over the whole cavity:



and, as I have observed, it is the chief excellence of this method, that we are enabled to irritate and affect every part equally, but moderately. From the capacity of the cavity, and the consequent improbability of the parts lying in contact with each other, after having been so largely distended for such a length of time, I formed a very unfavourable prognostic of the event. I saw him next morning; he said he had perceived a slight pain in the afternoon, for about two hours, since which he had been easy: a small degree of inflammation and tumefaction had taken possession of the part. The 14th, the second day after the operation, they were moderately increased; I began, from the appearances, to have hopes of success, as the inflammation was just as I wished: the 15th, appearances were similar to those of the day before: the 17th, the inflammation continued moderate and unattended with pain: the 20th, the eighth

eighth from the operation, the inflammation and tumefaction were less, and continued gradually subsiding; he was soon after discharged well. I have had many opportunities of seeing him since, and he remains perfectly so.

As I have mentioned in the last case, that I threw up the injection stronger than usual, I will take this opportunity to observe, that I have commonly used about two thirds of wine to one third of water; if the parts appeared insensible, and no pain at all was produced by the first quantity thrown in, I have withdrawn the syringe, and added to the proportion of wine; on the contrary, if the complaint was recent, and the parts irritable, I have increased the proportion of water, so that I have hitherto been principally guided by the degree of sensation which the patient has expressed. I have lately used pure water mixed with wine, and found it

answer as well as when astringents were added.

The instrument which I commonly use, is a pipe with a stop cock, which is made to fit into the cannula of a trochar, and to receive the beak of a syringe of a moderate size, which may be applied and removed at pleasure. I have sometimes used the vegetable bottle; but it has this inconvenience, that if it be not perfectly filled with the injection, it will, by its elastic power, draw in a quantity of air, which may prove very embarrassing in the operation.

## CASE VI.

THE next case which came under my care was a Hydrocele in the person of a middle aged man. As I was in search after a safe and easy method of curing this complaint,

plaint, I was pleased to find an external application strongly recommended as capable of discussing and curing it, by a gentleman of whose judgment and humanity I have the highest opinion. Although I had succeeded so well by injection, an external wash being more easily applicable, I was induced to give it a fair trial. May 5, the tumor was wrapped in cloths, wet with a solution of sal amoniac in acet. et spt. vin. After using it two days the patient complained so much of inflammation and irritation, attended with darting pains in the scrotum, that I was obliged to omit it for a day or two; after which time he used it lowered with a little water. May 27, after having continued this application nineteen days, I could find no sensible difference in the size or appearance of the tumor, except that the skin was corrugated and inflamed from the irritation of the application. May 30, no sensible alteration;

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he continued to use it, with now and then a small interval, till the 22d of June, when, tired at finding no benefit, he would not submit to any other operation, as was proposed to him, but chose to leave the hospital.

### C A S E VII.

AN intelligent gentleman, who had been in the medical line in India, shewed me a Hydrocele on each side; we talked over all the usual modes of curing the complaint; but he did not seem satisfied with either of them. I mentioned the solution of the salamon. and recommended him to give it a fair trial. He accordingly applied it, as it is directed; but, as it happened in the instance just mentioned, it produced so much inflammation, that he was obliged to desist. He afterwards used it for near three months,



months, at the end of which period, May 31, 1789, he again shewed me the tumors; but there was no perceptible diminution in their size.

### CASE VIII.

NOVEMBER 5, 1788, I took a young man under my care, who had apparently a Hydrocele; but it was one of those cases of which, on account of the tightness with which the coats enveloped the water, and from the thickness of the scrotum, we could not positively at once determine the nature: however, as I concluded it to be a Hydrocele, and, from its recent appearance, a favourable case, I immediately began to treat it with an external application of a solution of sal amon. but after seventeen days, finding no kind of advantage, and the man being impatient and anxious to return to his friends,

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I determined to use the injection. November 22, I let out about five ounces of clear fluid, found the testis in a good state, though enlarged, which, as I observed, is frequently, I might say generally, the case. I then filled the cavity with injection, in the presence of a number of gentlemen, and kept it in a few minutes; he complained of so little pain that I was apprehensive, and I believe all who were present concluded, that what I had done was to no purpose; that is, that there would not be sufficient irritation to produce the necessary inflammation. He continued without pain the whole of that day and the next; the third day he was perfectly easy, but a gentle inflammation had taken possession of the whole scrotum, equally in every part: the 5th day the inflammation continued as before, and the swelling was so free from pain, that it had strongly the appearance of a fresh collection of fluid; but, as this de-

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ception had several times occurred to me before, I did not the less expect a cure. On the seventh day from the operation the appearances were very similar, the man void of pain, the scrotum gently tumefied, from which time the scrotum began to corrugate, and the tumor gradually to decrease, till in less than three weeks it became of the size of the testicle, when the water was let out. I kept him in the house till the 21st of December, to observe if any fresh accumulation took place, when, being perfectly well, he was discharged.

### CASE IX.

A gentleman was introduced to me by Dr. Grieve, with a Hydrocele which had been treated with the same discutient, and which he had found so painful that his surgeon was obliged to lower it; it was continued, as

strong as he could bear, during five weeks, when the water, not being lessened, was let out, after which the application was again made use of during the evacuated state of the complaint; but it had not prevented the re-accumulation of the water.

It would certainly be a most desirable plan, to get rid of the disease without any operation; but we know too well how confined our powers are in dispersing collections of fluids within sacculi mucosi, and some kinds of encysted tumors, whose integuments are comparatively thin, and therefore must conceive, that much greater power would be requisite to act through the scrotum and thickened tunica vaginalis, so as to produce absorption of the fluid and cohesion of the tunics.

Hydroceles have been accidentally dispersed by various means, particularly by a blow, by a fever, and by sickness at sea. I do

not entertain the smallest doubt, that the above remedy, which has been proposed by an ingenious and able practitioner, has produced the same effect; but I cannot help doubting its capability of frequently producing it, from these and many other instances I have been witness to, and have been informed of, in which it has been equally unsuccessful.

The above gentleman, some time after, put himself under my care; I let out a moderate quantity of fluid, and threw in some injection. The inflammation which was produced in this case was so moderate that he would not submit to be confined; but in two or three days after the operation, notwithstanding the testis was evidently inflamed and larger than natural, went out and took his usual exercise. This brought on so much swelling as made him content to stay at home a fortnight, during which time it increased  
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in size, and gradually lessened; but at no time was at all painful, unless it was handled. Though, from the little attention paid to it at first, the tumefaction in this case had been rather obstinate, it was, in about three weeks, so nearly subsided, that he went out of town, with every appearance of the accomplishment of a perfect cure. I have seen him many times since, and there is no appearance of his ever having had a Hydrocele.

### C A S E X.

MR. PIRTS evacuated a large Hydrocele of a middle aged man; the testicle was found larger and harder than usual; he permitted me to throw in an injection, which, on account of the size and thickness of the parts, I had made rather stronger than usual; there was not quite enough to fill it, but I pressed it so as to make it find its way over  
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the whole cavity, and suffered it to remain in six minutes. I did not see him again till the fifth day; the scrotum was considerably inflamed, and tender to the touch. I directed him to remain in bed, and to apply a poultice made with extr. saturn. the next day the inflammation was lessened, and he was free from pain, and the tumor began to subside. There is so great similarity in the progress of these cases, that I have only to say the inflammation continued gradually to lessen, and in less than a month the testis was of its natural size, and the man was discharged. He has since been in the hospital for another complaint, and we have had opportunities of examining the part; the adhesion appears to have universally taken place, and consequently there is not the least vestige of the Hydrocele.

## C A S E , XI.

FEBRUARY 7, 1789, I emptied the Hydrocele of a young man, let out a moderate size tea-cup of fluid, threw in the same quantity of injection, and kept it in three minutes; the patient complained of some pain shooting toward his back: the 9th he had no pain; the inflammation very moderate: the 10th no great alteration; but I observed, what indeed I had often before remarked, that the scrotum appeared distended, as if again filling with water. The inflammation continued to proceed moderately, and gradually to subside. The patient was so free from pain and every complaint, that he chose to leave the house in less than three weeks; and, indeed, before the swelling was quite gone, to follow his occupation of a tide-waiter. I have since had many opportunities of seeing him and examining the part; the adhesion

adhesion appears perfect, and the disease completely cured.

## C A S E XII.

MARCH 6th, 1789, I went with Mr. R. Croft to see a young man who had a Hydrocele on each side. Mr. Croft had once performed the palliative cure on the left, which was now filled again, and was much larger than the other. I let out a large quantity of fluid, and found the testis in a good state, though larger than natural. I introduced sufficient injection to distend the bag, and kept it in four minutes; the man complained of some pain when it was first thrown in, but was perfectly easy before the four minutes were expired. I then proceeded to evacuate the other; but, as the quantity of water was small, and I could not safely introduce the instrument which I generally use for the purpose of injecting, I contented myself

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with

with emptying it by means of a small trochar, and found the testis large in proportion to the size of the tumor; I withdrew the cannula, and left it to take the chance of what might follow from partaking of the neighbouring inflammation which I expected to take place. Mr. Croft saw him the next day, and gave me an account that he had risen, and was walking about the room, and that the parts were beginning to swell. As this was greater liberty than I had yet given, I begged he might immediately go to bed, and have a poultice applied. I visited him next day, and found more inflammation than I had ever seen after this operation; and, what appeared extraordinary and fortunate, the side which had not been injected was almost as much inflamed as the other; but he complained not of the smallest pain in either. The 14th, I saw him again; he continued free from pain, and the inflammation was



very much abated. The side which had not been injected appeared less likely to diminish than the other ; and the apparent feel of fluid which I observed often follows, was more than usually perceptible. On the 20th, a fortnight from the operation, the side on which the injection had been used was perfectly well ; in the other the water was evidently collecting very fast ; which demonstrates how little effect external inflammation can have when it is to act through the scrotum and tunica vaginalis, and points out the greater certainty which follows the application of the stimulus to the inside of the cavity : in this case, notwithstanding the water was evacuated, and a much more considerable inflammation was raised on the scrotum than could have been caused by almost any external application, no internal effect was produced. I took leave of him, recommending him to do nothing farther till

it was sufficiently full to be treated in the same manner.

### C A S E XIII.

MR. CROFT continued to see him from time to time, and gave me an account that the side which had been injected, remained perfectly well; but that the other was large, and he wished me to perform the same operation on it. May the 2d, I examined it, and found the left side perfectly well, and free from water; the right distended, but not very large. I plainly discovered, through the water, that the testis was larger than it ought to be; and it was not without great care, that I was able to pass in the trochar without injuring it. I let out about five ounces of fluid, filled it with injection, and treated it in every respect like the other. I saw him two days after; he said he had passed a restless night, and the part was more inflamed

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and tumefied than usual; on inquiry, I found he had eaten a dinner of roast beef and drank porter. After taking a little opening medicine, and using a lower regimen, in two days the tumor was less, and the inflammation more moderate. In about the usual time he got well; and, I have been informed, he continues perfectly free from any complaint on either side.

#### C A S E XIV.

MAY 16, 1789, I let out about five ounces of a straw-coloured fluid from the Hydrocele of a young man, and threw in an injection; he complained of pain during the first three minutes, when he grew easy: in five minutes the injection was discharged. This proceeded, in every respect, like those I have related, with a very moderate inflammation, which decreased gradually.

He has since applied to me, with a vene-

real swelling in both his testes ; which, by means of mercurial frictions in the internal parts of his thighs, are both decreasing, but there is not the smallest sign of his ever having had water in either.

### C A S E XV.

IN the autumn of the same year a gentleman came from Barbadoes on purpose to be cured of a large Hydrocele. With his consent, I intended to use the method by injection ; but, at the instant when I had passed in the trochar, with a violent involuntary motion of his body he forced it out with the cannula, by which accident a small quantity of water only followed through the external orifice, but a considerable portion escaped from the tunica vaginalis, and insinuated itself into the cellular membrane of the scrotum, making a large swelling, which put  
a total

a total stop to the intended operation. As his time was limited, and he was anxious to return, he pressed me to perform immediately the operation by incision, or by any other method; however, I persuaded him to wait a fortnight, by which time the extravasated fluid was nearly absorbed: but, as the quantity which remained in the tunica vaginalis was small, and consequently the cavity was become less capacious; and as he was so particularly circumstanced with regard to leaving this country, I did not choose to try the injection, but there being just sufficient room for the instrument to pass safely, I performed the operation by the seton.

This case terminated well, and the gentleman is returned perfectly cured; but it was attended in its progress with an abscess, the consequence of a much greater degree of inflammation than I have ever experienced from the use of injection, and indeed  
abundantly



abundantly more than was necessary for the cure.

The accident by which the instrument was forced out may serve as a caution, and point out the propriety of placing the patient against a table, or upon a couch, or in any situation in which it will not be in his power to recede.

## CASE XVI.

ABOUT the same time I injected the Hydrocele of an Irish gentleman, aged 30. He felt little pain while the injection was in; the next day the inflammation was moderate, and proceeded in a gentle manner, with scarcely any variation from most of those cases in which I had used injection, and whose progress I have described; it is therefore unnecessary to take up more of the reader's time in particularizing the symptoms.

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The foregoing cases were published in my last treatise on this subject, but, for the reasons before mentioned, I have been induced to reprint them, and add others which have since occurred.

## C A S E   X V I I .

MARCH 9, 1790, a gentleman from Nottinghamshire applied to me with a Hydrocele on the left side; some few years before he had been troubled with the same complaint on the other, which had been cured by Mr. Pott by the seton, and continued perfectly well. I mentioned to him the method which I had adopted, and he agreed to give it a trial. Assisted by Mr. Long, I emptied the bag, which was not large, and filled it with injection, which was retained about the usual  
time;

time; he complained of little pain either during the operation or afterwards; the inflammation increased gradually, and so diminished; in a week after the operation he was permitted to walk, and in three weeks he was well enough to return into the country. In December 1790, I received an account from himself assuring me of his perfect recovery. As he had undergone the two different methods of cure, he was a competent judge with regard to pain and inconvenience attending both, and I make no scruple in asserting that he warmly declared his preference to the injection.

### CASE XVIII.

THE Rev. Mr. ——— shewed me a very large Hydrocele, which he desired me to cure by injection. April 15, 1790, having drawn off a large quantity of water, I refilled it with  
injection

injection of moderate strength, and retained it seven minutes, during which time he felt little pain; in the afternoon had a slight attack of pain; next day was perfectly easy, though there had arisen a sufficient inflammation, which increased gently, and gradually subsided, without pain or inconvenience. On the 4th of May he was well enough to go to his living in Huntingdonshire.

In November the same year, he did me the favour to call in Hanover-square, and permitted me to examine the part; it appeared so perfectly well, that, had it not been for a tuck in the skin where the water had formerly been let out by a lancet, and an adhesion had taken place between the scrotum and tunica vaginalis, it would have been difficult to have distinguished the side where the disease had been from the other.

## C A S E    X I X .

I saw Captain — with an uncommonly large and much distended Hydrocele, which, from having been continually pressed on by a suspensory, and tight breeches, had a remarkably broad basis, which reached from high up on one groin across the scrotum to the other thigh; I observed a large scar or cicatrix almost the whole length of it: the account he gave me of it was, that about a year and a quarter before, the operation of incision had been performed on it in Ireland; that so soon as the wound was healed, the water began to collect again; that he had suffered so severely by the operation, and by the subsequent treatment, that he was determined to ask no further advice on it, till, having been so long accumulating, it was from its size become intolerable: it was indeed so large, and the tunic so much thickened, that I ob-  
 jected



jected to performing any but the palliative operation, and recommended him to put off the attempt to cure it radically till it should fill again, and become of a more moderate size: however, as it would have been very inconvenient to him to come back again from Ireland, and as the injection could do no harm, if it did not succeed, I was induced to risk the credit of it; accordingly I emptied the bag, and threw in a very large quantity of the injection. He complained of a good deal of pain during the greatest part of the time it remained in, which was about seven minutes; considerable inflammation succeeded, and next day it appeared nearly as large as before it was let out, but he was quite free from pain: it continued inflamed and swelled for several days, when it gradually lessened; at the end of a fortnight it was nearly subsided, and he was permitted to walk about the room: on the 6th of May

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he went to his friend's house at Hampstead; the 7th I saw him; there appeared no more swelling than was caused by the still prodigiously large and thickened tunica vaginalis which had contained so much fluid, but there was no sign of any fresh accumulation: he had not the smallest pain, and took his exercise as usual. I saw him some time after, and the whole tumor was considerably lessened: he is since returned to Ireland; but, from his friends who reside in London, I have continual opportunities of knowing that he remains perfectly free from any return of his complaint. This case is more in favour of injection than any I have seen, as, from the great distention and size of it, there was the greatest improbability of the parts being brought sufficiently into contact to bring about an universal cohesion.

## C A S E XX.

MAY 4, 1790, I injected the Hydrocele of a patient of Mr. Pitts, which was large, but the sac thin; he complained of some pain during the operation, which ceased before the injection was withdrawn: next day he was perfectly easy; a gentle inflammation took place, which proceeded in every respect as usual. I have seen him since, and he continues perfectly well.

## C A S E XXI.

THE following case may prove an useful caution to future operators. A gentleman attempted to perform the operation of injecting a Hydrocele; but after he had passed the trochar and evacuated the water, before he had his apparatus and injection ready, by some accident the cannula

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flipped

slipped out of the sac of the Hydrocele ; when he attempted to throw in the wine it met with resistance, notwithstanding which he forced it in, till finding the whole scrotum on both sides uniformly increased in bulk, he began to suspect that he was not filling the cavity of the tunica vaginalis, on which he attempted to evacuate it, and get rid of what he had thrown in, but it was impossible. The injection having diffused itself among the cellular membrane under the scrotum, he was obliged to leave it there ; in consequence of which violent inflammation, and a mortification and slough of the scrotum, followed, and left the testes bare ; the patient however recovered.

I have been informed of another case, in which some portion of the injection was suffered to be diffused in the cellular membrane under the skin, which formed some small abscesses. If the operation be rightly performed

performed this can never happen ; or if by chance the cannula should slip out of the tunic, the completion of the operation pro hac vice should be suspended.

## C A S E XXII.

SEPTEMBER 1790, a gentleman of the profession from Barbadoes applied to me ; he said he had had a Hydrocele on the right side, which, after having tried to cure by the sal ammon. both in the full and empty state, in vain, had been cured by the seton, the marks of which were visible by the tucking in of the skin where the seton had passed. It remained perfectly well ; but he now laboured under the same complaint on the left. I let out the water, which was in small quantity, as the testis itself was very large and occupied the greatest part of the tumor, yet did not appear so hard or so diseased as to forbid an



attempt to cure the Hydrocele. I filled the cavity with injection, which gave little pain; sufficient inflammation succeeded, which gradually subsided: in less than a fortnight he was perfectly well, and went out about his business as usual; he assured me he found the injection an incomparably easier mode than the seton.

### C A S E XXIII.

OCTOBER 1790, a gentleman shewed me a Hydrocele of moderate size, which he had been endeavouring to discuss with the solution of sal ammoniac, and had tried it to the full extent of its powers; but, though it had raised great inflammation on the scrotum, had produced no effect in lessening the tumor. In the presence of Dr. Hallifax and Mr. Sergeant Hawkins, I drew off its contents, which were not remarkable in quantity or quality.

The

The patient appeared to be of a very irritable habit, complained of pain in his testis before the water was discharged, and his pain increased when the bag was empty ; I threw in an injection of moderate strength, from which he also expressed more than usual pain while it was retained, and after it was discharged ; this was much augmented by being obliged to go up stairs to his bed. Though the sensation which he expressed was very uncommon, it may serve as a caution against performing the operation out of the bed room ; when in bed he continued to complain, yet not of the testis, but of an aching in his back and kidneys, to which, however, he said he had been much subject : he took a gentle anodyne, and the pain subsided in about an hour and a half, after which he grew easy, and so continued all day. The next day there was some tension on the part, but the patient was perfectly easy ; in the afternoon he got

up and lay on a couch, and two days after went into the next room. The inflammation and tension increased gradually, and seemed at the height about the seventh day, after which it lessened; he was now only sensible of weight in the part. The tenth day he went down stairs, walked about, and sat on his couch; indeed, being of a lively and active disposition, he was not so attentive to keep in a quiet posture as I could have wished; however no accident to the part, nor impediment to its diminution, occurred; it gradually subsided, which, about the fourteenth, I hastened by a more powerful antiphlogistic application; soon after which time he went out in his carriage. November 12, three weeks from the operation, I examined the part; there was no inflammation remaining; it was free from fluid, and no bigger than what was produced by the large and thickened tunic wrapping round the testicle.

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I have repeatedly heard from this gentleman since, and he remains perfectly well.

On the same day, 5th of October, I performed the palliative cure on the Hydrocele of a young gentleman, and the only reason for my noticing it is, that on examining it the 14th, nine days from the operation, there was an evident fluctuation of re-accumulated fluid, which is a proof that it is not necessary to wait long before we may be convinced of the cure, or the return of the complaint, though the contrary doctrine has been advanced.

#### CASE XXIV.

NOVEMBER 13, 1790, I assisted Mr. Blicke, at St. Bartholomew's hospital, in letting out the water of a moderate sized Hydrocele of a young man which had been once before simply evacuated; it was now filled with

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injection,

injection, which was suffered to remain six minutes. The patient complained of some pain at first, but said he was easy before the injection was let out; after which, he walked without any uneasiness, or difficulty, to his ward. The 15th I saw him again; he had felt some pain for about an hour in the afternoon after the operation, and had been perfectly easy ever since; the whole scrotum appeared swollen and inflamed, but not painful. On the 20th it was subsiding, and it continued gradually to diminish.

December 1st I examined it; the testicle continued larger than the other, the coats probably not having had sufficient time to become thin; but there was not the smallest return of water.



## C A S E XXV.

FEBRUARY 1791, a gentleman from India consulted me on account of a large Hydrocele which had been collecting more than three years, and for which he wished to obtain a radical cure. As it was of considerable magnitude, and had never been emptied, I advised him to content himself, for the present, with the palliative cure; I let out about twenty ounces of straw coloured water, and found the testis much enlarged and the tunics apparently much thickened; the water soon began again gradually to collect. I saw him now and then till May following, when it was full enough to be submitted to the radical cure, and the mode by injection was determined on. After having passed in the trochar, while the fluid was running out, by some accident, the sac contracted quicker than the scrotum, and  
 let

let the cannula slip out. I was not able again to find the opening through which it had passed into the sac, though it was sufficiently open to permit part of the water to flow out of the sac, and insinuate itself into the cellular membrane of the scrotum; I therefore immediately desisted from the intention of completing the operation at that time. Though the quantity of extravasated fluid was considerable, it was attended with little inconvenience, and was soon absorbed: the Hydrocele filled again as usual; and in June following, it not being then convenient to him to undergo a radical cure, I again let out about the same quantity as it first contained.

About the same time a gentleman called on me from Oxfordshire, with a large swelling in the scrotum: the account which he gave me was, that the origin of it he could not account for, but that it had been gradually

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ally increasing for a great length of time, till about a twelvemonth preceding it was very large, and while it was in that state he had the misfortune of a severe fall from his horse; when he got home he perceived the whole scrotum enlarged, and the part where was the original swelling, smaller and softer; the skin was black from the bruise, but the whole of the swelling gradually went away, and he concluded he had got rid of his Hydrocele. However, he soon found that he was mistaken, as it soon began to be again distended, and in six months was as large as before. Notwithstanding the failure of success from it being thus burst, he was determined to try a similar operation, and therefore imprudently struck it with violence against a table; the same consequences followed as were produced by the fall, the sac was burst, the fluid found its way into the cellular membrane, and was, as before, gradually re-absorbed; and he again

found himself disappointed of a cure, as the Hydrocele again began to collect, and in six months more was as large as ever. He did not choose to push his own experiments further, but came to London to consult me, and wished me to perform the radical cure. It now appeared large, and much distended; but, as it was impossible to say what mischief had been done to the testicle by the violence which had been offered to it, and consequently I could not determine whether it was in a fit state to bear the necessary inflammation, I recommended the simple puncture to be first tried. On passing the trochar I was not surpris'd to find the fluid very deeply tinged with blood; the testis however did not appear to be much injured, though larger than natural. When he left me it was his intention to return to town as soon as it should again be filled.

I have mentioned these two instances in  
 5 confirmation

confirmation of what I before advanced, that it is not necessary in these cases of extravasation to perform the incision, or any other operation, only to wait with patience, and Nature will do her own work of absorption, which indeed may be promoted by the usual discutient applications.

### CASE XXVI.

JANUARY 1791, Mr. — shewed me a large tumor in the scrotum; he said he had perceived a small swelling in the part some years; that it had been long stationary as to size, and soft; and he always imagined it to be air. This was, probably, one of those kinds of Hydrocele which do not increase without a fresh cause, of which I have seen some instances. He had lately been thrown from his horse, and had bruised it greatly; when he was recovered from the external  
bruises



bruises he found the scrotum much enlarged and distended. I represented to him that it was filled with fluid, that probably the testis had been bruised, and that what before had been a simple Hydrocele, was now increased by an addition of blood. He wished the radical cure to be performed, but I recommended the simple puncture to be first tried, as it was not clear how far the testicle was concerned in the swelling: this was performed with caution, and with the point of a lancet. As I expected, a fluid immediately rushed out, of which blood appeared to constitute much the major part. As the nature of the case was now clear, which was all the information we wanted, and as the fluid did not freely follow through the small puncture, the orifice was closed and suffered to heal. March 6, 1791, it appeared again very full and turgid. As he now chose to have the radical cure performed, I passed in a trochar,

and

and let out about three parts of a pint of pellucid straw-coloured water. Here I must remark a fact which perhaps is difficult to be accounted for; the fluid which was left in the sac in January, was evidently composed of blood and water; from that time it continued to fill again, and when it was now let out it was perfectly free from blood, so that the absorbents, on the surface of the membranes, appeared, in this case, to have had the power of separating the red globules from the aqueous particles, and absorbing them; at the same time the water, so far from diminishing, was increased.

I threw in some injection, and he complained of little pain; he continued with scarcely any uneasiness all the day, but in the night was seized with a gouty cholic, to which he was much subject, and which he thought he had now brought on by abstinence, which he had observed some days  
previous

previous to the operation; this gave him a restless night, but he did not feel pain in the part. The next day he was well of this attack, and the part looked well, with rather more inflammation than usual, probably owing to the restlessness of the night, which made me keep him in bed longer than ordinary; however, the sixth day from the operation both swelling and inflammation were gradually subsiding, and on the fourteenth all inflammation and tenderness were wholly dissipated; the seventeenth he went out in a carriage, free from any pain or inconvenience; the complaint was completely got rid of, and he remains perfectly well.

### C A S E XXVII.

APRIL 26, 1791, I was desired by Mr. Long to use the injection in a Hydrocele of a middle aged man; the person said, several months

months before, he had overstrained himself in mowing, and had felt a violent pain, which he described to have been in the spermatic chord, reaching up to the loins ; that the chord swelled and inflamed, and afterwards, as that subsided, the Hydrocele began to collect below. I had seen the complaint in consultation some months before, when, though it was distended uncommonly high into the ring, we had concluded it to be a Hydrocele, and Mr. Long let it out by a puncture. Immediately after the operation a violent and very unusual pain, with subsequent inflammation, attacked the chord, which continued in a considerable degree, but did not, as was expected, produce a cure ; the water again began to accumulate, and on that taking place the inflammatory symptoms seemed to subside. These unusual complaints shewed something peculiar in the case, or an uncommonly irritable habit ; but as the Hydrocele was

again filled, I saw no objection to performing the operation for the radical cure. When I had punctured the bag, and was drawing off the water, in which there was nothing remarkable, he complained of great pain shooting up towards the kidneys on that side; on throwing in the injection he also complained more than common, but when the bag was completely filled, the pain subsided, and the injection was retained the usual time. The next day the part was more tumefied, and the chord more affected than generally happens, his pulse moderate, with no feverish symptoms; the following day he was somewhat better. The 3d of May, seven days from the operation, the tumor was much lessened, he felt no pain, and the scrotum was beginning to corrugate. I saw him again on the 9th of May, when he was able to walk and take his usual exercise. In about three weeks from the operation he was well, and



returned into the country perfectly cured of his Hydrocele.

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It was my original intention to have confined my observations in this treatise to the Hydrocele of the tunica vaginalis testis, which most commonly requires our assistance, and on which alone I had tried the effect of injection; but a particular case having occurred since the preceding papers were written, and having been submitted to this mode of cure, requires to be noticed; and as it materially differs from those I have hitherto described, one species being a distention of a natural cavity, the other of a cavity produced by the disease, some previous account of it becomes necessary.

The HYDROCELE of the SPERMATIC CHORD has been divided into two kinds, one of which is an extravasation of lymph, dif-

fused through the cellular substance of the spermatic vessels, and is called the Hydrocele of the cells of the tunica communis.

When this disease is simple it is perfectly local, that is, it is confined entirely to the membrane forming the tunica communis, and does not at all affect either the dartos, the tunica vaginalis, or any other part: while it is small it gives little trouble, and often passes for a varix of the spermatic chord; sometimes it arises to so large a size, and gets into such a state as to become an object of surgery.

If the extravasation be confined to what is called the spermatic process, the opening in the tendon of the abdominal muscle is not at all dilated, and the process passing through it may be distinctly felt; but if the cellular membrane which invests the spermatic vessels within the abdomen be affected, the tendinous aperture is enlarged, and the increased size of the distended membrane passing through it, produces

produces to the touch a sensation not very unlike an omental rupture.

As it is not probable that this complaint can be cured by the ordinary methods of treating the common Hydrocele, it is not properly the subject of our present enquiry. Mr. Pott has mentioned the incision as the only method of cure which it admits, and which, he observes, is far from being void of hazard.

The other species of the disease has been called the ENCYSTED HYDROCELE of the TUNICA COMMUNIS.

This, like the preceding complaint, has its seat in the tunica communis, or cellular membrane which invests the spermatic chord, with this difference, that in the former the fluid is diffused through the cells of the membrane; in this it is collected in one cavity or bag, which is formed, as the coats of encysted tumors usually are, by pressure and

condensation of the common membrane. It most frequently possesses the middle of the spermatic process between the testicle and groin. Like the common Hydrocele, its growth is gradual, and when of the size of the testicle, forms with it the outline of the figure of 8, beyond which period it varies in size and form, being sometimes oblong, though commonly continuing globular; whether it be large or small it is generally pretty tense, and the fluctuation of the water not easily perceptible. When lightly struck on with the finger it gives the sensation of a bladder distended with air, and has been mistaken for a species of pneumatocele, or wind rupture, a disease which does not exist; it gives no pain, nor unless it be very large, does it hinder any necessary action. It is perfectly circumscribed, and has no connection with the cavity of the tunica vaginalis below, or the abdomen above. The testicle

with

with its epididymis may be distinctly felt below the tumor, and are absolutely independent of it; and the upper part of the spermatic chord may generally be distinguished above it: it undergoes no alteration from change of the patient's posture, and is not affected by the action of the abdominal muscles in coughing, sneezing, &c.

These marks sufficiently describe the complaint, while it is simple and uncombined with any other; but when it is accompanied with a hernia, or a Hydrocele of the tunica vaginalis, it becomes more complex, and when the pressure from above or below is considerable, the nature of it sometimes cannot be precisely determined till the other complaints are removed; that is, till the contents of the abdomen are returned into their proper cavity, or the tunica vaginalis is emptied.

These are the diseases for which it is



most liable to be mistaken; but, as was observed, it is easy to be distinguished from the Hydrocele of the tunica vaginalis by the testicle being perceptible in its natural state below it; it sometimes indeed presses so high upward as to make it impossible to feel the spermatic chord above it, which gives the appearance of a descent from the abdomen: however, absence from every symptom of confinement of the intestinal canal, and the distinguishing symptoms and marks which were noticed when we were considering the Hydrocele of the tunica vaginalis, in the same situation, will be sufficient to point out the true nature of this disease. Some have proposed to cure this complaint by the application of a caustic, but I should conceive there would be great danger of its penetrating too deep, and injuring the spermatic vessels. A division through its whole length is the only method which Mr. Pott has proposed: but he

he observes, that though the operation may in general be performed with great ease and perfect safety, he has seen it prove troublesome, hazardous, and fatal. Of such consequence are wounds in membranous parts in some particular habits. Mr. Pott, with his usual candour, has related two cases of the encysted Hydrocele of the chord on which he performed the operation of incision; the first was laid open through its whole length, and a perfect cure was obtained: the other was in the same manner divided, but did not end so fortunately; the patient, though at the time of the operation apparently healthy, proved of an ill conditioned habit of body; the wound neither became tumid nor inflamed, his pulse hard and frequent, accompanied with thirst, restlessness, and a languor in his countenance. On the fourth day the incision still remained cold, lax, and flabby; and was so far from shewing any tendency to suppurate,

suppurate, that, on the contrary, the edges began to look livid, and, notwithstanding every medical assistance, he died on the seventh day.

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### CASE XXVIII.

THE case which I am to relate was of a person from Feverham, about fifty-four years of age. On examination there appeared a tumor in the spermatic chord, about the size of a moderate orange, hard and incompressible; he imagined it proceeded from a blow, and had perceived it a considerable time growing larger, without causing much pain; but it was now becoming more and more uneasy, from the distention of the increasing fluid.

Below this fulness the testis with its epididymis was perfectly distinct, neither enlarged, nor in any manner altered, and the termination

tion of the tumor above was perfectly free from any connection with the contents of the abdomen; the chord between it and the ring being to be felt in its natural state, though somewhat larger than usual. I made no doubt of the disease being an encysted Hydrocele of the spermatic chord.

The patient pressed me to make a permanent cure of his complaint, as he said his business was on board a ship, and the swelling was a great inconvenience to him.

Though I conceived the operation of incision might be performed in this case with less risk of violent symptoms than when the tunica albuginea is uncovered, as in the common Hydrocele, still I felt a repugnance to laying it open by a division of such membranous parts, and was inclined to try the effect of injection.

As the extreme sensibility of the tunics of the testicle had always appeared to me the  
cause

cause why so mild an injection as I usually employ in the common Hydrocele, is found to be sufficiently stimulating to produce the proper effect, I had much doubt whether in this case, in which it would not meet with such irritable surfaces, it would be powerful enough to raise the necessary inflammation: however, as the worst that could have happened would have been disappointment, I determined to try it of the usual strength. March 22, 1791, the trochar was passed through a very thick cyst, and let out a quantity of straw-coloured fluid, similar to what is usually found in the common Hydrocele; on the cavity being filled with injection no pain nor sensation was excited, on which account it was suffered to remain in near half an hour, and was then discharged. The injection having been so perfectly innocent, I expected the effect from it to be proportionally small; but was pleased to find, next day,

some



some inflammation on the part, and the patient said he had felt some pain. From that time it proceeded in every respect like a Hydrocele of the tunica vaginalis, it gently swelled, and had the appearance of a fresh collection of fluid; in about a week it began to subside, and gradually decreased, till, in less than three weeks, it came to the size of a small walnut, and felt to be only the remaining solid thickness of the cyst; after which it seemed stationary, and no alteration appearing likely to take place, about the end of the month from the operation he went into the country.

I had an opportunity of seeing him the 10th of May following, and the part which had been the seat of the disease was become so nearly of the size of the rest of the chord, that the difference was scarcely perceptible. This is an additional instance of membranous parts growing thick from pressure, and again becoming

becoming thin, and of their natural texture, from the absence of it.

The success of the vinous injection, in this and other cases where I have tried it, particularly in a large ganglion, and a collection of glair on the patella, makes it probable that it will be found extensively useful in all cavities where we wish to procure an adhesion without destruction of parts.

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WE have now considered all the methods which have been usually employed for the cure of this complaint, and I have endeavoured, with fairness and impartiality, to state the respective advantages and inconveniences attending them. The proportional merit however of different remedies can never be exactly determined; few men have opportunities of seeing a variety of remedies repeatedly tried, and perhaps still fewer possess a sufficient

cient

cient share of candour to weigh the merits and defects of each in an equal balance; consequently medical practice is never settled in any case till it be nearly perfect, or, at least, till some one proposed remedy bears no comparison in point of excellence with the rest.

Thus far however I think we may fairly gather from what has been related, that there are some so painful in the execution, and dangerous in their consequences, that they ought to be laid aside. Such appears to me the opening the sac of the Hydrocele, and laying bare the testicle, whether it be done with the knife or caustic; for although the operation of INCISION may have been improved by the ingenuity of some among the moderns, and the whole of the subsequent treatment rendered less violent than former methods, yet, as far as my opinion goes, the practice is still severe, unnecessary, and therefore wrong.

The

The **TENT**, after having been practised for two hundred years, has been so little used of late that we have scarcely sufficient data to judge of its effects and consequences; the instances which I have quoted are certainly not in its favour. On the whole, I should conceive it would have the principal inconvenience of the seton, that of being a solid body, without an equal extent of service. As the operation of it must necessarily be more confined, and touch a smaller surface, the inflammation which should follow would be less likely to be spread over the whole cavity of the tunica vaginalis than that induced by the seton, which passes through the whole of it; and when the Tent is introduced from an opening in the upper part it must be highly dangerous.

There remain the excision, the application of the small caustic, the seton, and injections.

The

The EXCISION may possibly be necessary in some old cases, where the coats, from long and repeated distention, are become thick and rigid: such, however, very rarely happen; nor can it be necessary in these until the milder methods have been tried and have failed.

With regard to the SMALL CAUSTIC and SETON, they have each so many advocates, that I am far from determining which deserves the preference: but for the reasons given, and which I repeat, the caustic being designed to destroy, and cause to slough away a portion of the scrotum, and the whole of the tunica vaginalis, which produces a painful and offensive ulcer; on the contrary, the object of the seton being to preserve, as much as possible, the natural and perfect state of all the parts, I am inclined to give my vote in favour of the latter.

They are both certainly great improve-  
M                          ments,



ments, in comparifon of all the preceding operations ; yet, as there are objections to be made to both, I fhall efteem myfelf fortunate, if I am the means of introducing into this country a method, which is not liable to the inconveniences attending either of them ; and I flatter myfelf I have related fufficient inftances to prove that the cure by INJECTION really deferves a preference.

There is one merit which I am confident the injection poffeffes in a very fuperior degree, that the inflammation which is excited by it is fo gentle, that it may be fafely ufed almoft under any circumftances, and at any period of life ; and if it fhould not fucceed, that is, if the inflammation fhould not be raifed to a fufficient degree to effect the purpofe of cohefion, it can do no harm, nor produce the fmalleft ill effect or inconvenience, provided it is properly performed. The fame confequences alone would take place as ufually

ally follow the mere letting it out by puncture. There would be a fresh accumulation of water, and we should not be prevented from another trial to cure it, by injection, by the seton, by caustic, or any other method, just as if no previous operation had been attempted.

F I N I S.

